

WANDSWORTH

E S. 50

Great Britain & Ireland.

The Journal

OF THE

Board of Agriculture.

VOLUME I.

(SEPTEMBER 1894 TO MARCH 1895.)



LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY EYRE AND SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from
EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or
JOHN MENZIES & Co., 12, HANOVER STREET, EDINBURGH, and
90, WEST NILE STREET, GLASGOW; or
HODGES, FIGGIS, & Co., LIMITED, 104, GRAFTON STREET, DUBLIN.

1895.

INDEX TO VOL. I.

(SEPTEMBER 1894 TO MARCH 1895.)

	Page
Adulteration of food products: Report from the Select Committee of House of Commons	106, 241
Agriculture (Board of):—	
Distribution of grants in aid of agricultural education in Great Britain, 1893-94: Report	244
List of leaflets	144, 272, 396
Pleuro-pneumonia in Canadian cattle: Papers and correspondence	91
Transit by water, &c., of animals: Report and evidence	239, 241
Agriculture:—	
In Finland	236
In Germany: The extension of the canal system	348
In Norway	85
Parliamentary publications	91, 239, 359
Royal Commission on, minutes of evidence, &c.	93, 363
In Roumania	238
In South Russia	340
In Uruguay	222
In Victoria	284
In Zululand	234
Animals:—	
Diseases of, in Great Britain	141, 266, 389
" " Ireland	142, 267, 390
Export from Ireland to Great Britain	124
Imports	109, 368
Transit by water, &c.: Report of departmental committee	239, 241
Anthrax:—	
In Great Britain	141, 266, 389
In Ireland	142, 267, 390
Antler moth, the	60
Aphis:—	
Bean	46
Cabbage and turnip	52
Woolly	300
Apple scab	47
Apples: New Zealand	322
Argentine Republic:—	
Wheat growing	165
" " at Santa Fé	67
Asia Minor: Growth of cereals in	84
Australia:—	
Horse-breeding	324
New South Wales, the frozen-mutton trade	69
Poultry-breeding	322
Queensland: Live stock	218
" Wheat-growing	62
Tasmanian butter	220
Victoria: Agriculture	284
" Dairying	20
" Production of wool	75
Austria-Hungary:—	
Crop prospects	36, 40, 195
Harvest of 1894	296

Austria-Hungary— <i>cont.</i>	Page
Horse-breeding	232
Vienna exhibition of agricultural machinery	328
Aylesbury duck-fattening industry	281
Bacon : Average value per cwt.	135, 258, 382
Banks :—	
Agricultural credit, in Russia	181
Post Office Savings : Advantages of, &c.	143, 259, 395
Barley : Prices of	136, 259, 382
Bean aphid	46
Beef : Average prices	134, 257, 380
Bee-keeping statistics of Ireland, 1893	359
Beet and mangel rust	203
Beet-sugar industry in Germany	85
Belgium :—	
Light railways	86
Peach growing	331
Birds :—	
Kestrel or Windhover	22
Short-Eared Owl	278
Sparrow Hawk	162
Bi-sulphide of carbon : Effect on the yield of crops of	73
Board of Agriculture :—	
Distribution of grants in aid of agricultural education, 1893-94 : Report	244
List of leaflets	144, 272, 396
Pleuro-pneumonia in Canadian cattle	91
Transit by water of animals, &c. : Report and evidence	239, 241
Board of Trade :—	
Profit sharing	91
United States customs tariff	249, 391
Weights and measures	365
Bonanza wheat farms in California and Dakota	65
Borough Market :—	
Prices of fruit	263, 388
" vegetables	140, 265, 387
Bouillie Bordelaise and potato disease	202
Breadstuffs in Germany : Consumption of	233
British Columbia : Horticultural legislation	307
British corn : Average prices	136, 259, 382
British harvest of 1894	273
Butter :—	
Export of Norwegian	68
" Tasmanian	220
Exports from Hamburg	81
Exports	117, 371
Imports	113, 371
Prices	138, 261, 385
Cabbage aphid	52
Cabbage-root maggot in America	309
Cake, sunflower-seed	72
California : Bonanza wheat farms	65
Canada :—	
British Columbia : Horticultural legislation	307
Colonisation of crofters and cottars from Ireland and Scotland	106
Experimental farms	326
Manitoba :—	
Crop prospects	33, 194
Exports of meat and dairy produce in 1894	329
Harvest of 1894	298
Live stock	33
Ontario : Crop prospects	32
Pleuro-pneumonia in cattle : Papers and correspondence	91

	Page
Canals in France - - - - -	346
Canal system in Germany - - - - -	348
Carbon bi-sulphide : Effect on the yield of crops - - - - -	73
Caterpillars, surface - - - - -	57
Cattle :—	
Average price per stone at Metropolitan Cattle Market - - - - -	135, 258, 381
County summary : Preliminary statement of number in Great Britain, 1893-94 - - - - -	122-3
Exports - - - - -	118, 292
Imports - - - - -	109, 368
Italian, statistics - - - - -	345
Number entering markets in Great Britain, with prices and number weighed, &c. - - - - -	125, 250, 350
Celery fly - - - - -	209
Celery-stem fly - - - - -	211
Cereals in Asia Minor - - - - -	84
Cheese :—	
Exports - - - - -	117, 371
Imports - - - - -	113, 371
Prevention of the swelling of cheese - - - - -	68
Prices - - - - -	138, 261, 385
Chicago grain trade - - - - -	81
Cider making in France - - - - -	152
Codlin moth - - - - -	214
Colonisation in Canada of crofters and cottars, &c. : Fifth report - - - - -	106
Commissions (Royal) :—	
On Agriculture : Minutes of evidence, &c., Vol. I. - - - - -	93
" " " " Vol. II. - - - - -	363
On Labour : Fifth and final report, Part I. - - - - -	94
The agricultural labourer : Miscellaneous memoranda, &c. - - - - -	100
" " " " Vol. V., Part I. - - - - -	247
On Land in "Wales and Monmouthshire : First Report - - - - -	106
Committees :—	
(Departmental) : Report on transit by water of animals - - - - -	239
" " " " Minutes of evidence, &c. - - - - -	241
(Select) " Of House of Lords on marking foreign and colonial produce : Second report - - - - -	103
Of House of Commons on food products adulteration : Report - - - - -	106
" " " " Minutes of evidence, &c. - - - - -	241
Congested districts, Ireland :—	
Report of Congested Districts Board for first quarter, 1894 - - - - -	365
Fifth report on scheme of colonisation in Canada of crofters and cottars, &c. - - - - -	106
Consular and diplomatic reports : Extracts - - - - -	79, 231, 336
Co-operative agricultural societies in France - - - - -	7
" dairying in New Zealand - - - - -	145
Corn duties, Spanish - - - - -	347
Corn, British : Average prices - - - - -	136, 259, 382
Cottars. See Crofters.	
Covent Garden Market :—	
Prices of fruit - - - - -	139, 262, 388
" vegetables - - - - -	140, 264, 386
Cranberries : Cultivation - - - - -	223
Credit banks : Agricultural, in Russia - - - - -	181
Crofters and cottars : colonisation in Canada, Fifth report of Her Majesty's Commissioners - - - - -	106
Crop prospects abroad - - - - -	31, 193, 295
Austria - - - - -	36, 195, 296
Denmark - - - - -	38, 195
France - - - - -	38, 195, 298
Germany - - - - -	39, 196
Hungary - - - - -	40
India, 1893-94 (wheat) - - - - -	34
" 1894-95 (wheat) - - - - -	296
Italy - - - - -	40, 197
Manitoba - - - - -	33, 194, 295

Crop prospects abroad— <i>cont.</i>	Page
Netherlands - - - - -	41, 197
Ontario - - - - -	32
Poland - - - - -	41
Roumania - - - - -	42, 197
Russia - - - - -	42, 296
Sweden - - - - -	198, 297
United States - - - - -	31, 193, 295
Crops :—	
Deep-rooted : Repeated cultivation - - - - -	70
Effect of carbon bi-sulphide on the yield of crops - - - - -	73
Insurance in Russia - - - - -	225
Customs tariff, United States : Return - - - - -	249, 391
Daddy longlegs - - - - -	49
Dairy :—	
Co-operative dairies in New Zealand - - - - -	145
Exports of dairy produce from Manitoba - - - - -	329
Exports of dairy produce - - - - -	117, 371
Imports of dairy produce - - - - -	112, 370
Industry in Denmark in 1893 - - - - -	80
Dairying and poultry keeping in Russia - - - - -	221
Dairying in Victoria - - - - -	20
Dakota : Bonanza wheat farms - - - - -	65
Denmark :—	
Agricultural depression - - - - -	82
Consumption of margarine - - - - -	65, 222
Crop prospects - - - - -	38, 195
Dairy industry in 1893 - - - - -	80
Export of frozen milk - - - - -	321
Trade in agricultural produce - - - - -	344
Depression of agriculture :—	
In Denmark - - - - -	82
In Oregon - - - - -	235
In Poland - - - - -	338
In United States - - - - -	17
Diamond-back moth, the - - - - -	48
Diplomatic and consular reports : Extracts - - - - -	79, 231, 336
Diseases of animals :—	
In Great Britain - - - - -	141, 266, 389
In Ireland - - - - -	142, 267, 390
Duck-fattening industry at Aylesbury - - - - -	281
Education :—	
Agricultural, distribution of grants in aid : Report, 1893-4 - - - - -	244
Ireland : Report of the Commissioners, 1893 - - - - -	107
Science and Art Department : Directory for schools, &c. - - - - -	108
" " " Report, 1893 - - - - -	93
Science, art, and technical instruction : Return under the Acts, 1892-3 - - - - -	248
Scotland : Report of Committee of Council, 1893-4 - - - - -	247
Eggs : Imports - - - - -	112, 114, 370
Egypt : Cultivation of onions - - - - -	333
Elevators, grain, introduction into India - - - - -	241
England :—	
Local taxation returns, 1892-93. Part I. - - - - -	102
" " " Part II. - - - - -	362
Exhibition of agricultural machinery at Vienna, 1895 - - - - -	328
Experiments :—	
In checking potato disease - - - - -	14
In planting potatoes - - - - -	176
Experimental farms in Canada - - - - -	326
Exports and imports of agricultural produce - - - - -	109, 368

	Page
Exports :—	
Animals from Ireland to Great Britain	124
Butter	117, 371
Cattle	118, 292
Cheese	117, 371
Hops	117
Horses	118, 374
Sheep	118
Swine	118
Wool	117, 372
Farcy. <i>See Glanders.</i>	
Farms, experimental, in Canada	326
Farmers and the income tax	158
Farringdon Market :—	
Prices of fruit	139, 262, 388
„ of vegetables	140, 264, 386
Fertilisers and Feeding Stuffs Act, 1893	276
Finland : Agriculture	236
Flax : Imports	116, 378
Flea, or fly, the turnip	55
Flour and grain :—	
Imports	114, 115, 376
Spanish duties	347
Swedish import duties	343
Fly :—	
Mangel	47
Turnip	55
Celery	209
Celery-stem	211
Fodder for milch cows : Potatoes	227
Food grains : Production of, in India	172
Food products adulteration : Report of the Committee	106, 241
Food supply, India : Effect of wheat exports	317
Forests : Trans-Caucasian	336
Foreign and Colonial produce marking of : Second report of the Committee	103
France :—	
Agricultural co-operative societies	7
„ population	318
Canals	346
Cider-making	152
Crop prospects	38, 195, 298
National high school of agricultural industries in	225
Frozen milk : Export from Denmark of	321
Frozen mutton trade of New South Wales	69
Fruit :—	
Cold storage	5
Farming	148
Imports	115, 377
Prices	139, 262, 386
Fungi, injurious :—	
Bouillie Bordelaise and potato disease	202
Larch disease	52
Legislation in British Columbia	307
Mangel and beet rust	203
Pear and apple scab	47
Potato disease	43
„ „ New	58
„ „ Experiments in checking	14
Potato fungus	206
Rust or mildew on wheat plants	199
Gardening, market	287
General Agricultural Notes	62, 218, 317

	Page
Germany :—	
Beet sugar industry	85
Consumption of breadstuffs	233
Crop prospects	39, 196
Extension of the canal system	348
Hamburg, exports of butter	81
Glanders :—	
In Great Britain	141, 266, 389
In Ireland	142, 267, 390
Glasgow : Prices of beef and mutton	135, 258, 381
Goat moth	304
Grain :—	
Chicago trade	81
Imports	114, 376
Production in India	172
Grants for agricultural education in Great Britain, 1893-94 : Distribution	244
Great Britain :—	
Agricultural education : Distribution of grants, 1893-94	244
Agricultural returns, 1894 : Preliminary statement	119
Diseases of animals	141, 266, 389
Exports of British cattle in 1894	292
Export of live animals from Ireland	124
Harvest of 1894	273
Hamburg : Exports of butter	81
Hams : Average value per cwt. of imported	135, 258, 382
Harvest of 1894 :—	
Austrian	296
British	273
Manitoba	298
Russian	296
Swedish	297
United States	295
Hay :—	
County summary of acreage in Great Britain, 1894	120
Imports	110, 268, 375
Hemp : Imports	116, 378
Hides : Imports	117, 379
Hops :—	
Acreage in 1894	124
Exports	117
Imports	115, 377
Produce, 1893-94	265
Horses :—	
Breeding in Austria-Hungary	232
Breeding in Australia	324
Exports	118, 374
Imports	111, 374
Horticulture :—	
Legislation in British Columbia	307
In Texas	88
Hungary : Crop prospects	40
Imports :—	
Butter	113, 371
Cattle	109, 368
Cheese	113, 371
Dairy produce	112, 370
Eggs	114, 370, 372
Flax	116, 378
Fruit	115, 377

Imports—cont.	Page
Grain and flour	114, 376
Hay	110, 268, 375
Hemp	116, 378
Hides	117, 379
Hops	115, 377
Horses	111, 374
Jute	116, 378
Lard	112, 370
Meat (fresh)	111, 369
Meat (salted and preserved)	112, 369
Rabbits	369
Seeds	116, 378
Sheep	109, 368
Straw	110, 268, 375
Vegetables	115, 377
Wheat and wheatmeal	115, 376
Wood and timber	117, 379
Wool	116, 372
Import duties :—	
Spanish, on wheat and flour	347
Swedish, on wheat and flour	343
Income tax : Farmers'	158
India :—	
Madras, demand for ploughs	325
Production of food grains	172
Railways : Administration report, 1893-94	366
Wheat crop	34, 296
Wheat exports, effect on the food supply	317
Wheat : Papers relating to the impurity of, and the establishment of warehouses	241
Wheat : Papers relating to the introduction of grain elevators	241
Industries, agricultural, National High School in France	225
Insects, injurious	43, 199, 300
Antler moth	60
Bean aphid	46
Cabbage root maggot	309
Celery fly	209
„ stem fly	211
Codlin moth	214
Daddy longlegs	49
Diamond-back moth	48
Goat moth	304
Legislation in British Columbia	307
Mangel fly	47
Nut mite	48
Surface caterpillars	57
Turnip and cabbage aphid	52
Turnip fly or flea	55
Wireworms	53, 311
Woolly aphid	300
Insurance of crops in Russia	225
Ireland :—	
Agricultural statistics for 1893	245
„ „ „ 1894 : Report relating to migratory agri- cultural labourers	245
Agricultural statistics, 1894 : General abstract	246
„ „ 1894 : Acreage and produce of crops	359
Bee-keeping statistics, 1893	359
Congested Districts Board : Report for first quarter of 1894	365
„ „ Fifth report on the colonisation in Canada of crofters and cottars	106
Diseases of animals	142, 267, 390
Education, National, Report, 1893	107
Export of live animals to Great Britain	124
Irish Land Commission : Report for 1893-94	107
Land Acts : Report, minutes of evidence, &c. of Select Committee	365
Local taxation returns, 1893	363

Italy :—	
Cattle statistics	345
Crop prospects	40, 197
Margarine law	90
Jute : Imports	116, 378
Kestrel or Windhover	22
Labour : Agricultural, in July 1894	77
" in September and October 1894	228
" in January 1895	330
Royal Commission on : Fifth and final report, Part I.	94
" " " The agricultural labourer, Vol. V., Part I.	247
" " " Do. do. miscellaneous	
memoranda	100
Labourers, migratory agricultural, Ireland : Report	245
Lamb. <i>See Mutton.</i>	
Land Acts, Ireland : Report, &c., of Select Committee	365
" Commission, Irish : Report for 1893-94	107
" Royal Commission on, in Wales and Monmouthshire : First report	106
" tenure in New Zealand	67
Larch disease	52
Lard : Imports	112, 370
Leaflets published by the Board of Agriculture	144, 272, 396
Light railways in Belgium	86
Liverpool : Prices of beef and mutton	135, 258, 381
Live stock :—	
Exports from Ireland to Great Britain	124
In Manitoba	33, 194
In Queensland	218
In Texas	231
Prices as returned under the Markets and Fairs (Weighing of	
Cattle) Act, 1891	125, 250, 350
Returns of, in Great Britain, 1894	122
Local taxation returns :—	
England, 1892-93. Part I.	102
" " Part II.	362
Ireland, 1893	363
Scotland, 1892-93	362
London, Central Meat Market :—	
Prices of beef, mutton, pork, veal, lamb	134, 257, 380
Machinery (Agricultural) :—	
Demand in Turkey	83
Vienna, International Exhibition	328
Madras : Demand for ploughs	325
Mangel fly, the	47
" and beet rust	203
Manitoba :—	
Crop prospects in	33, 194
Exports of meat and dairy produce in 1894	329
Harvest of 1894	298
Live stock	33
Margarine :—	
Consumption of, in Denmark	65, 222
" " in Norway	71
Law in Italy	90
Prices	138, 261, 385

	Page
Market gardening	287
Markets and Fairs (Weighing of Cattle) Act, 1891 :—	
Number and prices of animals entering the markets and number weighed, &c.	125, 250, 350
Markets :—	
London Central Meat: Prices of dead meat	134, 257, 380
Borough and Spitalfields :—	
Prices of fruit	263, 388
" vegetables	140, 265, 387
Covent Garden :—	
Prices of fruit	139, 262, 388
" vegetables	140, 264, 386
Farringdon :—	
Prices of fruit	139, 262, 388
" vegetables	140, 264, 386
Stratford :—	
Prices of fruit	139, 263, 388
" vegetables	140, 265, 387
Marking of foreign and colonial produce : Second report	103
Meal (wheat) : Imports	115, 377
Meat :—	
(Dead) imported : Average values per cwt.	135, 258, 382
Exports from Manitoba in 1894	329
Frozen mutton trade of New South Wales	69
Imports of fresh	111, 369
Imports of salted and preserved	112, 369
Prices	134, 257, 380
Metropolitan Cattle Market: Average prices of live meat per stone	135, 258, 381
Mildew or rust on wheat plants	199
Milk (frozen) : Export from Denmark	321
Mite : the nut	48
Moths :—	
Antler	60
Codlin	214
Diamond-back	48
Goat	304
Mutton, frozen: Trade of New South Wales	69
Mutton and lamb : Average prices	134, 257, 380
 Netherlands :—	
Crop prospects	41, 197
Rotterdam oleomargarine trade	237
New Zealand :—	
Apples	332
Co-operative dairying	145
Land tenure	67
New South Wales : Frozen mutton trade	69
Nicotine for sheep scab	63
Norway :—	
Agriculture	85
Consumption of margarine	71
Export of butter	68
Export of sheep to England	29
Nut mite	48
 Oats : Prices	136, 259, 382
Old age pensions : Advantages offered by the Post Office Savings Bank	269
Oleomargarine trade, Rotterdam	237
Onions : Cultivating, in Egypt	333
Ontario : Crop prospects	32
Oregon, agricultural depression	235
Owl, short-eared	278

	Page
Parliamentary publications - - - - -	91, 239, 359
Agriculture, Royal Commission on :—	
Minutes of evidence Vol. I. - - - - -	93
" Vol. II. - - - - -	363
Board of Agriculture :—	
Canadian cattle affected with pleuro-pneumonia : Further papers, &c. - - - - -	91
Distribution of Educational Grants : Report, 1893-94 - - - - -	244
Transit by water of animals :—	
Report of committee - - - - -	239
" Evidence - - - - -	241
Board of Trade :—	
Profit sharing : Report by Mr. Schloss - - - - -	91
Customs tariff of United States, 1894 - - - - -	249
Weights and measures : Report - - - - -	365
Crofter and Cottar Commission : Fifth report, 1893 - - - - -	106
Food products, adulteration :—	
Report of committee - - - - -	106
" with evidence, &c. - - - - -	241
India : Railways, report on, 1893-94 - - - - -	366
Indian wheat :—	
Papers as to impurity of, and as to the establishment of warehouses, &c. - - - - -	241
Papers as to introduction of grain elevators - - - - -	241
Ireland :—	
Agricultural statistics, with report, 1893 - - - - -	245
" 1894, with report as to migratory labourers - - - - -	245
" abstract 1893-4 - - - - -	246
" acreage 1894, bee keeping statistics, 1893 - - - - -	359
Congested Districts Board : Third report, 1894 - - - - -	365
National education : Report, 1893 - - - - -	107
Land Acts : Report of committee, with evidence - - - - -	365
Land Commission : Report, 1893-94 - - - - -	107
Labour, Royal Commission on :—	
The Agricultural Labourer, Vol. V., Part I. - - - - -	247
" miscellaneous memoranda - - - - -	100
Fifth and final report, Part I. - - - - -	94
Land in Wales and Monmouthshire : First report of Royal Commission - - - - -	106
Local taxation returns :—	
England, 1892-93, Part I. - - - - -	102
" 1892-93, Part II. - - - - -	362
Ireland, 1893 - - - - -	363
Scotland, 1892-93 - - - - -	362
Marking of foreign and colonial produce : Second report of committee - - - - -	103
Science and Art Department :—	
Report, 1893 - - - - -	93
Directory for schools, &c. - - - - -	108
Science, art, and technical instruction : Return of disposal of funds, 1892-93 - - - - -	248
Scotland : Education, report, 1893-94 - - - - -	247
Welsh Land Commission : First report - - - - -	106
Woods and forests : Report - - - - -	364
Peach-growing in Belgium - - - - -	331
Pear and apple scab - - - - -	47
Pensions, old age : Advantages offered by the Post Office Savings Bank for Pigs. See Swine. - - - - -	269
Pleuro-pneumonia :—	
In Canadian cattle, papers and correspondence - - - - -	9
In Great Britain - - - - -	141, 266, 389
In Ireland - - - - -	142, 267, 390
Ploughs in Madras, demand for - - - - -	325
Poland :—	
Agricultural depression - - - - -	338
Crop prospects - - - - -	41
Population, agricultural, of France - - - - -	318
Pork : Average prices - - - - -	134, 257, 380

	Page
Portugal, the cultivation of wheat - - - - -	342
Post Office Savings Banks, advantages - - - - -	143, 269, 395
Potatoes :—	
Acreage of, in Great Britain in 1894, county summary - - -	120
Experiments in planting - - - - -	176
As fodder for milch cows - - - - -	227
For stock feeding - - - - -	25
Potato disease :—	
A new potato disease - - - - -	58, 206
Bouillie Bordelaise and - - - - -	202
Description, methods of prevention, remedies, &c. - - -	43
Experiments in checking - - - - -	14
Poultry breeding in Australia - - - - -	322
Poultry keeping and dairying in Russia - - - - -	221
Poultry rearing in Sussex - - - - -	186
" in Russia - - - - -	13
Prices :—	
Barley - - - - -	136, 259, 382
Butter - - - - -	138, 261, 385
Cheese - - - - -	138, 261, 385
Corn, British - - - - -	136, 259, 382
Fruit - - - - -	139, 262, 386
Live stock, as returned under the Weighing of Cattle Act, 1891	125, 250, 350
Margarine - - - - -	138, 261, 385
Meat (live and dead) - - - - -	134, 257, 380
Oats - - - - -	136, 259, 382
Vegetables - - - - -	139, 262, 386
Wheat - - - - -	136, 259, 382
Produce, agricultural :—	
Imports and exports - - - - -	109, 368
Danish trade - - - - -	344
Swiss trade - - - - -	337
Produce of hops, 1893 and 1894 - - - - -	265
Foreign and colonial produce : Second report on marketing -	103
Profit-sharing : Report on - - - - -	91
Publications :—	
Parliamentary, dealing with agriculture (<i>see</i> Parliamentary Publica- tions) - - - - -	91, 239, 359
Queensland :—	
Live stock - - - - -	218
Wheat growing - - - - -	62
Rabies :—	
In Great Britain - - - - -	141, 266, 389
In Ireland - - - - -	142, 267, 390
Railways :—	
(Light) in Belgium - - - - -	86
In India, administration report, 1893–94 - - - - -	366
Remission of tithe rentcharge - - - - -	155
Returns :—	
Agricultural, of Great Britain, 1894, preliminary statement -	119
Agricultural, county summary :—	
Acreage under wheat, potatoes, and hay - - - - -	120
Number of cattle, sheep, and pigs - - - - -	122
Agricultural, hop acreage, 1894 - - - - -	124
" export of live animals from Ireland to Great Britain -	124
" of Ireland, 1893 - - - - -	245
Rew, R. H. : Report on poultry rearing in Sussex - - - - -	186
Rotterdam, Oleomargarine trade - - - - -	237

	Page
Roumania :—	
Condition of agriculture	238
Crop prospects	42, 197
Russia :—	
Agricultural credit banks	181
Agriculture in South	340
Crop prospect	42
Harvest of 1894	296
Insurance of crops	225
Poultry-keeping and dairying	221
Poultry rearing	13
Trans-Caucasian Forests	336
Wheat growing	228
Rust :—	
Mangel and beet	203
Wheat rust or mildew	199
Santa Fé: Wheat growing	67
Savings Banks, Post Office, advantages	143, 269, 395
Seab : Pear and apple	47
Science and Art :—	
Directory with regulations for schools and classes, &c.	108
Forty-first report of the Department	93
Return of funds devoted by county councils, &c. for purposes of science, art, technical instruction, &c., 1892-3	248
Schloss, Mr. D. F. : Report on profit-sharing	91
Schools, for Agricultural Industries in France	225
Scotland :—	
Education Report, 1893-94	247
Local Taxation Returns, 1892-93	362
Seeds : Imports	116, 378
Seed cake : Sunflower	72
Sheep :—	
Average price per stone at Metropolitan Cattle Market	135, 258, 381
County summary, preliminary statement, of number in Great Britain, 1894	122
Export to England of Norwegian	29
Export	118
Imports	109, 368
Number entering markets in Great Britain, with prices and number weighed, &c.	125, 250, 350
Sheep scab : Nicotine for	63
Short-eared owl	278
Societies : Agricultural co-operative, in France	7
Spanish corn duties	347
Sparrow-hawk	162
Spencer, Aubrey : The duck-fattening industry at Aylesbury	281
Stock : Potatoes for feeding	25
Storage, cold, of fruit	5
Stratford Market :—	
Price of fruit	139, 263, 388
" vegetables	140, 265, 387
Straw : Imports	110, 268, 375
Sugar : The beet industry in Germany	85
Sunflower seed cake	72
Surface caterpillars	57
Sussex :—	
Poultry rearing and fattening	186
Woodlands	64
Sweden :—	
Crop prospects	198
Harvest of 1894	297
Duties on wheat and flour	343

	Page
Swelling of cheese	68
Swine :—	
County summary, preliminary statement, of number in Great Britain,	
1894 -	122-3
Exports of	118
Fever, in Great Britain	141, 266, 389
" in Ireland	142, 267, 390
Number entering markets in Great Britain, with prices and number weighed, &c.	125, 250, 350
Switzerland : Trade in agricultural products	337
 Tariff, United States: Statement of rates of import duty	 249, 391
Tasmania : Export of butter	220
Tax, income : Farmers and the	158
Taxation, Local :—	
Annual Returns, England, 1892-93, Part I.	102
" " " Part II.	362
Ireland, 1893	363
Scotland, 1892-93	362
Technical instruction : Return of funds devoted by county councils for the purposes of	248
Tenure of land in New Zealand	67
Texas :—	
Horticulture	88
Live stock	231
Wheat growing	79
Timber : Imports	117, 379
Tithe rentcharge : Remission	155
Trans-Caucasian Forests	336
Transit by water of animals, &c. :—	
Report of Departmental Committee	239
Minutes of Evidence, &c.	241
Turkey : Demand for agricultural machinery	83
Turnip aphid and the cabbage aphid	52
" fly or flea	55
 United States :—	
Agricultural depression	17
California and Dakota, Bonanza wheat farms	65
Chicago grain trade	81
Cost of growing wheat	3
Crop prospects	31, 193
Harvest of 1894	295
Oregon, agricultural depression	235
Tariff, return of rates of import duty, &c.	249, 391
Texas, horticulture	88
" Live stock	231
" Wheat growing	79
Uruguay :—	
Agriculture	222
Agricultural statistics	71
 Veal : Average prices	 134, 257, 360
Vegetables :	
Imports	115, 377
Prices	139, 262, 386
Victoria :—	
Agriculture	284
Dairying	20
Production of wool	75
Vienna : Exhibition of agricultural machinery	328

	Page
Wales and Monmouthshire : Report of Welsh Land Commission	106
(Weighing of Cattle), Markets and Fairs, Act, 1891 : Returns	125, 250, 350
Weights and measures : Report of the Board of Trade	365
Wheat :—	
Acreage of, in Great Britain, 1894 : County summary, preliminary statement	120
Bonanza, farms in California and Dakota	65
Crop in India	34, 296
Cultivation in Portugal	342
Growing at Santa Fé	67
Growing in the Argentine Republic	165
Growing in Russia	228
" Queensland	62
" Texas	79
" the United States	3
Imports	114, 376
India :—	
Papers relating to the impurity of wheat, &c.	241
" introduction of grain elevators, &c.	241
Effect of exports on food supply	317
Meal, imports	115, 376
Prices	136, 259, 382
Rust or mildew	199
Swedish import duties	343
Spanish duties	347
Windhover or Kestrel	22
Wireworms	53, 311
Wood : Imports	117, 379
Woodlands in Sussex	64
Woods and Forests : Seventy-second report of Her Majesty's Commissioners, &c.	364
Wool :—	
Exports	117, 372
Imports	116, 372
Production of, in Victoria	75
Woolly aphis	300

Zululand : Agriculture	234
------------------------	-----



[PRICE SIXPENCE.]

[All rights reserved.]

(OFFICIAL COPY.)

The Journal

Great Britain & Ireland. OF THE

Board of Agriculture.



September 1894.

	Page
COST OF GROWING WHEAT IN THE UNITED STATES	3
COLD STORAGE OF FRUIT	5
AGRICULTURAL CO-OPERATIVE SOCIETIES IN FRANCE	7
POULTRY REARING IN RUSSIA	13
EXPERIMENTS IN CHECKING POTATO DISEASE	14
AGRICULTURAL DEPRESSION IN THE UNITED STATES	17
DAIRYING IN VICTORIA	20
THE KESTREL OR WINDHOVER	22
POTATOES FOR STOCK FEEDING	25
EXPORT OF NORWEGIAN SHEEP TO ENGLAND	29
CROP PROSPECTS ABROAD	31
INJURIOUS INSECTS AND FUNGI	43
GENERAL AGRICULTURAL NOTES	62
EXTRACTS FROM DIPLOMATIC AND CONSULAR REPORTS	79
PARLIAMENTARY PUBLICATIONS	91
IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCE	109
AGRICULTURAL RETURNS OF GREAT BRITAIN, 1894	119
PRICES OF LIVE STOCK	125
STATISTICAL TABLES	134

(For detailed Table of Contents see page xiii of Advertisements.)



LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,

BY EYRE AND SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from
 EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or
 JOHN MENZIES & Co., 12, HANOVER STREET, EDINBURGH, and
 90, WEST NILE STREET, GLASGOW; or
 HODGES, FIGGIS, & Co., LIMITED, 104, GRAFTON STREET, DUBLIN.

CARTERS'

HAVE BEEN
AWARDED
More
Prize
Medals



THAN
Any other
Seed House
IN THE
WORLD.

Some Important Orders entrusted to Messrs. CARTER.

FOR HER MAJESTY'S GOVERNMENT.

One Hundred and Fifty Acres of Grass Seeds.

"I have great pleasure in confirming the statement I have already made with respect to the successful results achieved on 150 acres of a barren waste after preparing for and using your Grass Seeds."—Mr. H. HACKER, Royal Engineers' Office.

FOR HER MAJESTY'S GOVERNMENT.

The whole of the Hyacinths, Tulips, and other Bulbs required to decorate the London Parks, in the Spring of 1895, are being supplied by us.

FOR THE CANADIAN GOVERNMENT.

Ten Thousand Bushels of Carter's Prize Prolific Barley were distributed to Farmers in the Dominion for improving the stocks of the Country.

IMPORTANT TESTIMONY FROM NEW ZEALAND.

"I have till lately owned the Mangatoro Station, over 30,000 acres, and have laid down in permanent pasture some **26,000 Acres** of that property with **CARTERS' SEEDS**, with widely-known and completely successful results."—November 4th, 1893.

ONE THOUSAND TONS OF SEED POTATOES

were ordered from us by the Management of the Irish Distress Fund for improving the stocks of the Country.

AN HONOUR FROM THE FRENCH GOVERNMENT.

The Ordre du Mérite Agricole—the highest distinction in French Agriculture—has been conferred upon us by the French Government, and we are the only English Seed House that has been thus favoured.

We shall be pleased to send copies of our
Illustrated Catalogues of Agricultural or Garden Seeds
post free to any part of the world on application.

*Seedsman by Royal Warrants to H.M. the QUEEN, and H.R.H. the PRINCE OF WALES,
To the Home, Colonial, and many Foreign Governments.*

237, 238, and 97, High Holborn, London.



The Journal

OF THE

Board of Agriculture.

Vol. I.]

September 1894.

[No. 1.

INTRODUCTORY NOTE.

IN introducing the first number of the Journal, the Board of Agriculture consider it desirable to indicate briefly the class of information it is likely to contain.

The Board have been in the habit of issuing from time to time, as the necessity arose, leaflets dealing chiefly with insects and other pests injurious to agriculture, and this form of publication has been found useful on occasions when it has been expedient to insure a rapid and effective circulation.

There is, however, accessible to the Board, information of a less urgent character, but possessing more or less interest for agriculturists in this country. With the double object of providing a suitable channel for giving publicity to such information, and securing a medium for systematically recording certain statistical and other intelligence which could not be seasonably or conveniently inserted in the annual publications of the Department, the Board have deemed it desirable to issue a quarterly Journal.

It is proposed to publish in the Journal information as to the condition of agriculture in the colonies and abroad, derived from the Reports of Foreign and Colonial Governments, Diplomatic and Consular Despatches, and other sources.

An endeavour will be made to record the results of researches officially conducted at foreign agricultural experiment stations, as well as by experts in this country and elsewhere. Notices will also be given of any noteworthy innovations in the system of cultivation, and of any improvements in the methods of marketing and distributing agricultural produce, which may come under the notice of the Board.

Each number of the Journal will contain a series of notes on the crop prospects in foreign countries and British Possessions. Short descriptions of insects and fungi injurious to agriculture, and of other farm pests, will likewise be included.

It is further proposed to utilise the Journal for the publication of special extracts from the Agricultural Returns, and summaries of the returns of contagious diseases of animals in the United Kingdom, together with notes on the imports and exports of agricultural produce, prices of live stock, grain, meat, dairy products, fruit, and vegetables. It is hoped that the systematic publication of these statistics in a collected form will be found convenient for purposes of reference.

The Board will be glad to receive any suggestions for the improvement of the Journal. All communications on the subject should be addressed to the Secretary, Board of Agriculture, 4, Whitehall Place, S.W.

Board of Agriculture,
September 1894.

I.—COST OF GROWING WHEAT IN THE UNITED STATES.

In consequence of the numerous inquiries relative to the cost of raising the principal cereals, a careful investigation has been made by the Department of Agriculture of the United States as to the cost of raising the staple products, corn and wheat, in that country. It is stated in the March Report of the Statistician of the Department that the results of this investigation are considered to be of unusual economic importance in view of the low prices of wheat prevailing throughout the world, and it is added that the time has come to sound a note of warning to American farmers against the exclusive dependence on this crop in favour of a more diversified culture.

The following items were considered in making an estimate of the total cost of raising wheat, *viz.*, rent of land, manure, seed, labour, and marketing of the crop. The item labour includes the expenses incurred in the preparation of the soil, and in sowing, harvesting, threshing, and housing.

The results have been derived from individual estimates made by over 25,000 practical farmers, and indicate an average cost per acre for the entire country of 48s. 8½*d.* A second set of replies was received from over 4,000 experts, the graduates of various agricultural colleges now engaged in farming, and the estimate made by these gentlemen tallies very closely with the above, being 47s. 10*d.* per acre.

The following statement shows in detail the cost of producing wheat in the different sections of the United States as ascertained from the returns obtained from the farmers:—

Sections.	Cost per Acre.					
	Rent of Land.	Manures.	Seed.	Labour.	Market-ing.	Total.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	£ <i>s. d.</i>	<i>s. d.</i>	£ <i>s. d.</i>
New England - - -	14 8	18 4½	9 0	1 16 11	5 3½	£ 4 4 3
Middle States - - -	16 8½	21 6	5 10	1 8 0½	3 8	3 15 9
Southern States - - -	11 7½	8 8½	3 10½	0 18 1	3 3½	2 5 7
Western States - - -	10 11	7 8½	3 10	1 0 2	2 9	2 5 4½
Mountain region - - -	16 2	11 3	3 11½	1 7 10	6 7½	3 5 10
Pacific States - - -	13 9½	10 11	4 3½	1 3 9½	5 5½	2 18 3
Average for the United States -	11 8½	9 0	4 0	1 0 10	3 2	2 8 8½

The minimum cost per acre was returned from South Dakota, for which State the estimate was 35s. 8*d.* per acre, while the highest return was received from the State of Connecticut, in which the cost of growing an acre of wheat was stated to be 5*l.* 9s. 9*d.*

The average yield per acre of wheat in the United States for the four years 1890-93 was 12·9 bushels, and this at 48s. 8½*d.* per acre works out to 3s. 9*d.* per bushel.

About two-thirds of the wheat crop is grown in the section regarded by the Statistician in the present estimate as Western States. This section consists of fourteen States, viz: West Virginia, Kentucky, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, and North Dakota. Within this very varied group the estimated cost per acre ranges from the low figure quoted above for South Dakota to the sum of 57s. 7½*d.* in Michigan, while the average cost of production for the section is about 3s. 4*d.* per acre less than the average for the entire country. For these fourteen States the average yield per acre in 1893 was only 11 bushels, so that the cost of producing a bushel of wheat in this region was about 4s. last year.

The largest wheat-growing State outside the area of the so-called Western States is California, where the average yield per acre in 1893 was 13·3 bushels. The total expenditure in cultivating an acre of wheat in this State is estimated at 56s. 3*d.*, or about 4s. 2*d.* a bushel on the average yield of last year.

In the Statistician's report for December 1893, the average farm value per acre of wheat produced in the United States was stated as 25s. 8*d.* This, it is observed, would show on the face of it a virtual loss to the farmer of 23s. per acre of wheat for the year 1893. It must be remembered, however, that besides the production of the grain the farmer has the straw, which has in some sections of the country a feeding value of about 20s. per acre, and that while the cost of production was about normal, the price per bushel of wheat was unprecedentedly low.

II.—COLD STORAGE OF FRUIT.

The first report, 1894, of the Department of Agriculture and Forests of New South Wales, contains some particulars of the results of a series of experiments in the cold storage of fruit, carried out last year by the Fruit Expert of the Department, at the cold storage rooms attached to the Government meat-market at Darling Harbour.

The system of cold storage employed was one in which an even temperature combined with a constant influx of cold fresh air was maintained, and this system, or rather principle, is, it is said, the only satisfactory one for use in the case of fruit, as a merely cold air, without the necessary ventilation and influx of fresh air, has been proved to be insufficient to keep fruit in good condition for any length of time.

The fruits experimented with consisted of the following varieties, viz. :—apples, pears, plums, peaches, nectarines, grapes, mangoes, pineapples, tomatoes, and passion fruit, and were obtained from fruit-growers in various parts of the Colony. Different materials were tried for packing, and the fruit was tested under various conditions, wrapped and unwrapped, in light cases and open well-ventilated cases, and in various stages or degrees of ripeness. The average temperature was 41·74 degrees, and was very evenly maintained. The extreme limit of variation ranged from 37 degrees to 51 degrees, and these extremes were only reached on two or three occasions. The ventilation was at all times satisfactory.

The experiments are stated to have shown that apples, mid-season and late variety of pears, solid-fleshed plums, and tough-skinned fleshy grapes may be kept in perfect condition without any appreciable loss for a period of two months, when stored in a cold dry fresh air, maintained at an even average temperature of 41 degrees to 43 degrees, provided that the fruit is carefully gathered, handled, and packed, and that all blemished fruit is discarded. It appears that apples will keep equally well if the temperature is raised 10 degrees, but the other fruits require the lower temperature. Two months allows for the extreme outside time required to place the fruit on the English market.

After being removed from the cold storage chamber, the fruit is said to keep in good condition for a sufficient time to enable it to be disposed of and consumed, with only a small per-centage of loss, provided that previous to its removal from cold storage the temperature of the store is gradually raised to that of the outside air, as condensation of moisture, which would tend to create decay, is thereby prevented.

It was found that soft fruit, such as peaches and nectarines, may be safely stored without deterioration from one to two

weeks, according to variety, thereby preventing to a certain extent the glutting of the markets with these fruits during the height of the season.

The cost of cold storage by this method is estimated to be much less than that of the method now used for the conveyance of fruit to England, and the results are stated to be much better. At present the three great drawbacks Australian fruit-growers have to compete with in the export of fruit to the English market are—first, the excessive freight; second, the large per-centage of loss arising through the fruit being carried without a proper system of ventilation; and third, the bad keeping qualities of the fruit when landed, which necessitates the fruit being disposed of and consumed as rapidly as possible. It is maintained that all these drawbacks would be, to a great extent, prevented if the fruit were carried under similar conditions to those maintained during the experiments, and a cheaper and better carriage would tend to greatly increase the export of fruit to England. Fruit-growers in the Colony are reminded that the English market wants one class of fruit only, the best, and that fruit put on the market in the best condition and most attractive manner; and that if growers or shippers try to palm off any inferior grades they will get left every time, as English buyers will not have them, except at low rates.

The Government of New South Wales claim to have practically shown the conditions that are necessary in order to successfully keep fruit in cold storage, and also what fruits are most suitable, and what care is necessary to be taken with the grading, wrapping, and packing of the fruits so as to render them suitable for cold storage, especially as adapted to an export trade. It is pointed out to fruit-growers that it is to an export trade they must eventually look if fruit growing is to take a prominent place in colonial industries; and by showing how the export of fruit may be most economically and successfully carried out, these experiments are likely to be of great value to the fruit-growers and to the Colony in general.

III.—AGRICULTURAL CO-OPERATIVE SOCIETIES IN FRANCE.

In the *Annuaire des Syndicats Professionnels*, published by the French Ministry of Commerce, it is stated that the number of agricultural co-operative syndicates existing in France on the 1st July 1892 was 863.

In addition to the 863 registered in 1892 there were seven associations which had not complied with the legal requirements as to registration, but which were nevertheless tolerated by the State. M. Hautefeuille, in the *Annuaire des Syndicats Agricoles*, states that there are now about 1,100 agricultural syndicates in France. In this estimate, however, he includes a number of syndicates of horticulturists, market gardeners and florists, as well as numerous small societies formed for the protection of vines against the phylloxera, and for the destruction of cock-chafers and other noxious insects.

According to the official *Annuaire*, the total number of members in the 870 agricultural syndicates existing in July 1892 was 313,800. This figure is regarded as too low by a writer in the *Nouvelle Revue*, who estimates that about 500,000 individuals, whom he styles the *élite* of French agriculture, are enrolled in the syndicates.

The majority of the syndicates have combined for the formation of a number of unions or federations. In July 1892, 653 of the "syndicats agricoles" were officially returned as being affiliated to 74 unions. Of these 469 were connected with the "Union des Syndicats des Agriculteurs de France," having its headquarters at Paris; 127 were represented in six regional unions; and the remaining fifty-seven were affiliated to seven departmental unions.

The administrative staff of a syndicate consists nearly always of a president, a vice-president, a secretary, and a treasurer. Some of the larger bodies have two or even three vice-presidents, and sometimes a secretary general with two or three assistants. These officers form the executive bureau or council. In cases where the number of members exceeds one hundred there is usually, also, a syndical chamber, or directorate, with duties of a merely consultative character, but nevertheless exercising more or less control over the council of management. A salaried manager is employed in a few instances, but it more frequently happens that the whole of the work is performed by the president and other officials, who receive no remuneration for their services. The members of the bureau or council are elected for a term of years either by votes at the general meeting, or where there is a directorate, by the directors from amongst themselves. The

directors are always elected at the general meetings for a period varying from two to nine years. When the operations of a syndicate extend over a considerable area it is usual to select a director for certain districts or divisions. Thus, in the large departmental syndicates a director is elected for each *arrondissement*. Smaller bodies having members resident in several communes or villages, generally arrange that the syndical chamber shall be comprised of delegates representing each village, or commune, in which not less than ten members reside. In both cases, the director or delegate acts, as a rule, as the administrative agent for his district, and conducts the necessary correspondence with the central office.

The syndicates derive their resources mainly from the members' subscriptions, and from a small commission levied on the sales and purchases effected. Some of the more fortunate among them have been the recipients of gifts, and legacies, while others are subsidised by the "*conseils-généraux*" and by the agricultural societies. Usually the subscription ranges from 2s. 6d. to 5s. per annum, though in a few cases it is less than half the smaller sum mentioned. Sometimes there is a graduated scale of subscriptions arranged to meet the circumstances of the different classes of members, so that a poor peasant farmer pays less than his richer neighbour, while the labourer's contribution is merely nominal. Another system has been adopted by three or four associations whereby the ordinary members' subscriptions are proportional to the area of land they own or occupy or to the amount of land tax to which they are assessed. Then, too, in many syndicates there are, in addition to the ordinary members, "*funders*" and "*honorary members*," chiefly country squires, retired officers, and other local magnates who are candidates for the more prominent positions in the syndicates, and whose subscriptions always exceed those of the ordinary members. It is not improbable that the success which has marked the rise and progress of the co-operation in French agriculture is in no small measure due to the experience and intelligence of these founders and honorary members, most of whom are energetic as well as ornamental supporters of the movement, as is shown by the flourishing condition of the organisations with which they are connected.

It is an almost general practice to charge a small commission on the transactions undertaken on behalf of the members, especially in respect of the purchase of manures. This is done to defray the expenses of analysis and distribution. The commission is usually fixed at 1 per cent. or 2 per cent. on the invoiced prices; it seldom exceeds 4 per cent.

Of the 870 agricultural syndicates existing in France, 59 have less than 20 members each, 291 have from 21 to 100 members, 371 have between 100 and 500 members, 71 have more than 500, but not more than 1,000 members, and in 72 cases the number of members exceeds 1,000. Among these last, there are 13 associa-

tions with from 2,000 to 5,000 members, 3 with more than 5,000 but less than 10,000, and 2 with over 10,000.

The organisations which have 1,000 members and upwards are principally departmental syndicates, that is to say, their operations extend over an entire Département. Next to these rank the regional syndicates covering two or more divisions of a Département, and then come the smaller bodies, communal or village syndicates, representing a comparatively small area.

The majority of the village, communal, and regional syndicates are affiliated to the more powerful departmental organisations, and the latter in their turn have combined in the formation of unions and federations.

Nearly all the syndicates were originally formed for the purchase in common of artificial manures and for the suppression of fraud in the manure trade: two objects which still constitute the main features of their work. Members are requested by circulars, or by notices inserted in the journal of the syndicate, to send in their orders to the central office on or before a certain date, once or twice in the year according to the practice and requirements of the district. The orders represent collectively a more or less considerable quantity which can usually be purchased, either by private treaty or by tender, at a price little, if anything, above the wholesale quotations. Samples of the articles are analysed by the chemist attached to the syndicate, and if these are found to be satisfactory the manures are subsequently distributed by road and rail to the members. A small commission is levied to defray the costs of analysis and distribution.

To promote the use of artificial fertilisers, some of the larger organisations have established, in the villages, dépôts where the peasant may obtain his few sacks of manure on payment of a sum only slightly in excess of that charged to a member who purchases in bulk.

Co-operation in purchase has in recent years been extended to feeding stuffs, seeds, insecticides, machines, implements, and numerous other requisites, professional and domestic, of the farmer.

The procedure is practically the same in all cases. Invoices are checked and passed by the council of the syndicate, and bills are drawn by the manufacturers and tradesmen on the individual members for goods supplied. If it is found necessary to take proceedings against a manufacturer for fraud, these are generally instituted by, and at the expense of, the syndicate, but in the name of the aggrieved member.

Few of the associations undertake responsibility in respect of payment for goods ordered on behalf of the members. As a rule the manufacturer or dealer has to draw a bill, sometimes for an insignificant sum, payable at one, two, or three months, on each individual who sent in an order. But although the syndicates offer no material security to the trade, their reputa-

tion for soundness in business affairs is in itself a moral guarantee. It very rarely happens that a farmer fails to meet an engagement contracted through his syndicate, for default invariably entails expulsion.

It has been maintained that the system of purchase in common, inaugurated by the syndicates, has had the effect of reducing the prices of manures and other articles used in agriculture by 20 to 30 per cent. This benefit has not been confined solely to the members of these bodies, as the publicity given to the prices paid, and the increased competition amongst manufacturers, have tended to make the reduction general.

Many of the associations have extended their purchases to grocery, clothing, crockery, and other household requisites. In several cases the transactions of buying and selling have been so numerous that it has been found convenient to organise this branch of the business in the form of a separately registered "société de consommation," or general co-operative store, supplying every requisite both for the farm and the house. This course enables the syndicate to devote more attention to the improvement of the social condition of the members.

There are indications that the tendency to the establishment of general stores in connection with the agricultural associations is likely to increase. Two or three departmental agricultural syndicates have already opened central dépôts of this nature in the towns, with branches in rural districts. Where this has been done the members are able not only to purchase their domestic requirements at cheaper rates than before, but they have likewise the advantage of finding a ready and profitable outlet for the disposal of some of their produce by supplying the central dépôts with butter, eggs, poultry, and vegetables.

Much remains to be done by the syndicates in the direction of co-operation in sale. When it is remembered that corn, vegetables, meat, and dairy produce have usually to be sold in separate markets, under entirely different conditions, it is not surprising to find that facilities for the sale in common of these products exist in only a few societies. Then, in addition to the difficulties of distribution alluded to, the interests of the individual members are not always identical, and, as may be imagined, it is frequently to the advantage of a seller that his neighbour's goods should not compete in the same market. This conflict of interests is less operative in syndicates situated in the vicinity of large centres of consumption. Where these bodies have established general co-operative stores of the nature described above, it has been possible to apply the principle of co-operation in sale to butter, cheese, eggs, and similar produce with comparatively satisfactory results.

But although few attempts have been made to deal with the co-operative disposal of agricultural produce in bulk, numerous and successful efforts have been made to provide readier and more profitable channels of distribution for certain products of

"la petite culture." A number of syndicates have devised schemes for bringing consumers into direct communication with producers by means of the parcel-post and express railway delivery service. In this way quite a large trade has sprung up in some districts in butter, cheese, honey, olives, and similar articles. As a further inducement to purchasers, several societies guarantee the quality of the goods supplied.

An extensive parcel-post trade is done in butter by the co-operative societies in Normandy and other dairying districts. Orders are addressed to the central offices and distributed for execution among the members, the syndicates guaranteeing the purity of the article supplied. It is usual to furnish the consumer with the name and address of the producer of the article, in order that further transactions may take place between the parties without the intervention of the syndicate.

Cheese, olive oil, honey, and wax are similarly distributed in postal parcels up to $5\frac{1}{4}$ lbs. in weight. The same medium is likewise made use of for the conveyance of samples of the bulkier forms of produce.

Fruit and vegetables, fresh and dried, are supplied by several syndicates direct to consumers by rail or parcel delivery, and in one or two instances these bodies have established permanent markets for the sale of this form of produce in the small towns.

Large quantities of cut flowers are distributed through the post by the syndicates of the southern Departements of the Republic. In the vine-growing districts, sample bottles of wine are similarly conveyed to intending purchasers, and an important parcel-post trade in fresh raisins has recently been started in these regions.

It should be observed, also, that there is a large and growing inter-syndicate trade in seeds, potatoes, fruit trees, and similar articles.

Of the land banks which have been opened by five associations, two only are of any importance; one established by the syndicate of Poligny in the Jura, the other by a syndicate at Genlis in the Cote d'Or. These two banks are constituted on the basis of mutual credit; that at Genlis was opened some three years ago, but the Poligny bank was established in 1851 and amalgamated with the syndicate in 1884. The older institution was founded with a capital of 400*l.* in shares of 2*l.* and 25*l.* each.

Members of the Poligny Syndicate can obtain loans not exceeding 24*l.* on condition that the money borrowed is intended solely for the purchase of seeds, manures, or implements. In 1885 the loans amounted in all to 217*l.*, and in 1891, with the assistance of the Bank of France, to 6,360*l.* In 1891 the capital was increased by 436*l.*, so that the subscribed capital amounted to 1,640*l.*, of which about 1,100*l.* was paid up.

The bank at Genlis has a capital of 4,000*l.*, of which 1,000*l.* has been paid up and deposited, in the form of railway shares, in the Bank of France. This deposit induced the latter institution to make two advances amounting to 1,600*l.* on the securities, and a further sum of 4,000*l.* on discount, thus enabling the Genlis bank to grant loans to the amount of 8,000*l.* in 1890. Any member of the syndicate may borrow on two conditions, viz.:—1, that the money is used for the purposes of agriculture; 2, that good and solvable security is forthcoming. The loans bear interest at $3\frac{1}{2}$ per cent. Those for less than 20*l.* can be renewed twice; those between 20*l.* and 40*l.*, once; while loans exceeding 40*l.* are only renewable when, by partial repayment, they fall under one of the two former categories.

In 120 of the syndicates, arrangements have been made for the settlement of disputes between members by a committee of arbitration. The decision of the committee is final, and if a member refuses to accept it he is generally expelled from the syndicate. The larger bodies with different classes of members sometimes provide that the committee should be constituted with regard to the status of the interested parties; thus, in the case of a dispute between a labourer and a proprietor, the committee would consist of a labourer, a proprietor, and the president of the syndicate.

The provision of old age pensions has been undertaken by two or three of the smaller organisations, but particulars of the systems adopted are not yet forthcoming.

Two syndicates have made arrangements for the insurance in crops against damage from hail. The insurance of live stock is undertaken by seventeen of these associations. The premiums are usually at the rate of 7*d.* in the £ for horses, and 5*d.* in the £ for cattle. In some cases the payment of a small sum not exceeding 1*s.* 6*d.* insures the member of a syndicate against the loss of an animal from castration, amputation of the tail, and other minor operations.

It would be tedious to enumerate in detail the efforts which have been made by the syndicates in other directions. These comprise the opening of village libraries; the establishment of an orphanage and almshouses; the creation of mutual aid and sick benefit societies; and in one or two instances the adoption of a scheme of insurance against accidents.

Nearly all the syndicates publish a journal, weekly, monthly, or quarterly, which serves to keep the members posted up on matters connected with their respective associations, and is used as an advertising medium for trading purposes between the members of syndicates situated in different districts.

IV.—POULTRY REARING IN RUSSIA.

A report on Agriculture and Forestry published by the Department of Agriculture of the Ministry of Crown Domains, St. Petersburg, contains some information as to the condition of the poultry rearing industry in Russia. Poultry rearing in Russia is, it appears, comparatively little developed in spite of conditions favourable to the industry such as great areas of free land, the abundance of cheap grain, and a moderate climate in a considerable portion of the Empire. The slow development is attributed to the small home demand for poultry. Recently, however, foreign agents have organised regular offices for the purchase of poultry and eggs, and owing to the increasing foreign demand it has been discovered that poultry rearing can be made very remunerative to the poorer classes, especially to the peasants.

For export Russian eggs are bought in the spring and the autumn, costing from 20s. to 30s. per 1,000, the price being usually highest in the autumn. They are packed, as in Western Europe, in long boxes divided into two sections, with fine straw between the layers, each box containing twelve great hundreds. Before packing, the eggs are sorted, and only the largest exported, the smaller eggs being consumed locally and used in albumen factories. Since 1886 Russia has exported large quantities of the yolks and whites of eggs as separate products in tin boxes packed in barrels. In winter, dead poultry is consigned to foreign markets in a frozen state. Live fowls are exported in plaited baskets made of willow boughs, from six to twenty-five pairs of fowls in each crate. For sea-transportation about fifty birds are put into lattice-work boxes. Besides eggs and poultry, down and feathers are also exported in considerable quantities.

In 1881 the total export of poultry and poultry products from Russia amounted in value to about 284,800*l.*, while ten years later these articles were exported to the value of 1,883,800*l.* The eggs and fowls are principally sent to Germany, Austria, France, and England, but the prices in England are said to be always higher than in the continental markets.

Improved methods of breeding and feeding poultry are little known in Russia. Artificial hatching by means of incubators is practised on a very small scale. Only one establishment for the artificial fattening of poultry is known. Large poultry yards, where birds of good breed can be obtained, are found near St. Petersburg, but most farmers prefer to import bred poultry from Germany, France, and England.

V.—EXPERIMENTS IN CHECKING POTATO DISEASE.

The Secretary of the Irish Land Commission in a Report, dated June 23rd, 1894, to the Under Secretary to the Lord Lieutenant, furnished an account of a series of field experiments carried out by the Agricultural Department of the Irish Land Commission during the summer and autumn of 1893, for the purpose of further testing the value of applications of a mixture of copper sulphate and lime to the potato plant as a preventive of disease. The experiments were arranged with a view to obtaining information on the following points, viz. :—

- (1.) Should the potato plant be sprayed from above only, from below only, or both from above and below ?
- (2.) Is it sufficient to thoroughly spray the potato plant once only, provided that the dressing be applied when the foliage is fully developed and immediately before the earliest period at which the disease may be expected in the locality ?

It was further decided to test the efficacy of a mixture containing 2 per cent. of copper sulphate as compared with one containing but $1\frac{1}{2}$ per cent. of copper sulphate.

In order that the experiments should be uniform and as serviceable as possible to the Irish farmer, the Champion variety of potato only was experimented upon, that being the variety most generally grown for home consumption in Ireland.

The experimental areas were divided into eight separate plots of 20 perches, except in one set of experiments in which the plots were slightly smaller. Four plots were tested with a $1\frac{1}{2}$ per cent. mixture in the following manner :—The plants on the first plot received one dressing from above and below ; in the case of the second plot the dressing was applied twice from above and below the leaves ; while the plants in the remaining plots received two dressings, one from above the leaves only, the other from below the leaves. A similar course was adopted in dealing with the four plots treated with the 2 per cent. mixture.

The 2 per cent. mixture consisted of 2 lbs. copper sulphate, 1 lb. unslaked lime, and 10 gallons water ; the $1\frac{1}{2}$ per cent. mixture consisted of $1\frac{1}{2}$ lbs., copper sulphate, $\frac{3}{4}$ lb. unslaked lime, and 10 gallons water ; the proportion of lime used was amply sufficient to neutralise all acid, and to precipitate all the copper.

The first dressings were applied at the latter end of June, and the second dressings about one month later. The amount of dressing applied per acre varied from 100 to 160 gallons, in proportion to the quantity of foliage to be treated.

At the end of September the produce of one perch in each plot was carefully dug and weighed ; at the time of digging,

the tubers in the treated plots were still adhering to the fibrous roots; the haulm on the untreated plots was generally quite withered and dried up, on the plots which had been dressed once only it was almost in the same condition, but on the plots which had been twice dressed the haulm was still green and succulent, though the leaves had withered away. On all the treated plots there was a notable absence of weeds as compared with those untreated, due to the greater luxuriance and continuation of growth of the haulms and foliage on the treated plots choking out the weeds, while the untreated haulms having died off early in the season allowed the weeds to have their own way.

There were nine complete series of experiments, in each of which there were eight treated plots or 72 treated plots in all, 36 of which were sprayed with a 2 per cent. mixture, and 36 with a $1\frac{1}{2}$ per cent. mixture.

A comparison of the results obtained in those plots which were similarly treated with respect to the method and frequency of application, but which varied with respect to the per-centage of copper sulphate contained in the mixture applied, indicates that the best results were obtained with a 2 per cent. mixture in 21 cases, and with a $1\frac{1}{2}$ per cent. mixture in 15 cases.

The plots which gave the highest value in yield in each of the nine sets of experiments had been dressed, in six instances, with a 2 per cent. mixture, and, in three instances, with a $1\frac{1}{2}$ per cent. mixture.

Comparing the results obtained in each set of experiments by the different systems of application adopted, irrespective of the per-centage of copper sulphate contained in the mixture, it appears that the plots giving the highest yield in value in each set of experiments were dressed in two instances from above and below on one date only, in one instance from above only, and in six instances from below only, the dressings in these last seven cases having been applied on two separate occasions at intervals of about four weeks.

A comparison of the average returns per acre of those plots which received similar treatment in each series of experiments shows that the plots which were sprayed from above and from below, on two distinct occasions, gave the best average returns.

Comparing the mean results obtained on those plots in each set of experiments, which were treated similarly as to the method of dressing, and number of dressings given, but one of which was dressed with a $1\frac{1}{2}$ per cent. mixture, and the other with a 2 per cent. mixture, it appears that on the duplicate plots, giving the highest mean yield in value, the dressing was applied from above and below in one instance on one date only, and in two instances on two separate occasions at intervals of about four weeks, while in two instances it was applied from above only, and in four instances from below only.

It would appear, therefore, that in the case of the Champion variety of potatoes it is desirable to use a mixture containing

2 per cent. of copper sulphate and to apply the dressing twice at least; probably a mixture containing only $1\frac{1}{2}$ per cent. of copper sulphate would be more suitable for those varieties the foliage of which is more tender than that of the Champion; in no instance did it appear that the foliage had been injured by the strength of the mixture applied.

The results obtained from the nine complete series of experiments show that the average increase of yield of sound potatoes on the treated as compared with the untreated plots was 2 tons 13 cwt. 6 lbs. per statute acre, and the average net gain on the treated as compared with the untreated plots was 4*l.* 8*s.* 2*d.* per statute acre.

In the case of six of the 72 sprayed plots the results show net losses varying from 1*l.* 15*s.* 1*d.* to 1*s.* $1\frac{1}{2}$ *d.* per statute acre; in four of the instances referred to the plots were those which had been sprayed on one occasion only, all the other sprayed plots in the same series of experiments showing marked gains as compared with the results on the untreated plots.

A further series of experiments was carried out at the Botanic Gardens, Glasnevin, under the direction of Mr. F. W. Moore, M.R.I.A., with a special view to ascertaining:—

- (1.) Whether any portion of the copper contained in the dressing finds its way into the tissues of the foliage, and if so, how, and in what form.
- (2.) If the plant is rendered practically disease proof by the absorption of copper by the tissues of the leaves, although all traces of the dressing may have been removed by rain.

The analyses made in connection with these experiments were conducted by Sir Charles A. Cameron, Professor of Chemistry, R.C.S.I., who, with Mr. Moore, afforded valuable advice and assistance in arranging the details of the various experiments.

It is stated that, owing to various unforeseen circumstances, rendering the data obtained unreliable, the results of these experiments at the Botanic Gardens, though carried out with great care, cannot be regarded as conclusive; it is, therefore proposed to renew them during the present season.

VI.—AGRICULTURAL DEPRESSION IN THE UNITED STATES.

The condition of agriculture in the United States forms the subject of a report recently issued by a Sub-Committee appointed by the Senate, in February 1893, to investigate the condition of the agricultural industry as it relates to grain and farm interests.

The Sub-Committee state that after careful consideration they have arrived at the conclusion that while there have been fluctuations, and while different conditions prevail in different localities, upon the whole there has been a settling downward of the general level of the prices of farm lands and farm products since 1873, and that the depression has been on the average about thirty per cent.

The causes of the depression are divided into three classes :— Special causes which affect particular classes or species of property locally; general causes affecting particular kinds of property; and general causes which affect all kinds of property in greater or less degree.

In respect of the special causes, attention is mainly directed to the local conditions which affect in some degree the prices of grain and live stock, and influence the value of the land. As regards the causes of the second class, it is pointed out that although the market values, as well as the local prices, of the cereals are affected more or less by large or small yields from year to year, yet the effects produced in this way are less marked now than during the period before facilities for distribution had reached their present state of development. When 30 to 40 days were required for the passage of a ship, with a cargo of 10,000 bushels of wheat, across the Atlantic; before the telegraph was used to convey information concerning crops; before the Suez Canal was opened for traffic; and before steamships were built capable of conveying 100,000 bushels of wheat from New York to Liverpool in ten days; a very heavy or a very light crop of any particular kind of grain in the United States materially affected American market prices for the surplus. Now, however, with the existing conveniences for handling, storing, and shipping grain, and with low rates of transportation over long distances, it is the world's production, and not that of any one country, that affects the market value of grain. But while the competition of farmers in other wheat-producing countries is regarded as having a material effect in depressing the price of this cereal in the United States, the competition amongst American grain farmers themselves, and particularly that form of it known as "bonanza" farming, has also contributed to bring about a fall in local and general prices.

This method of farming is reported to have reduced the cost of producing wheat in the Dakotas to about eighteen pence a bushel on an average yield.

Improvements in farm implements and machinery are admitted to have had some effect in reducing the cost of production on large estates, but it is doubted whether they have had much influence in this direction on small farms.

Among the further causes of the depression, the Sub-Committee refer particularly to certain forms of business carried on in the produce exchanges, known as dealing in "Options and Futures," and to the organisation of facilities for quickly and cheaply collecting grain at great centres. By far the larger part of the surplus wheat of the country is said to find its way to the elevators at Chicago, Toledo, and other cities soon after it is harvested. The grain dealers and merchants at these points have their agents scattered throughout the wheat-growing region when the grain is being threshed, and, in the West and North-west, most of the grain is sold as soon as the threshing is completed. The country is thus rapidly drained of wheat, and while the process is going on, every dealer is interested in keeping prices at the lowest point. The influence exercised by these operations is stated to be immense when concentrated upon a single crop. The principle involved is the same as that which operates in all great combinations of men and capital in particular enterprises. The dealers are there to make money, and their profits come from purchases and sales. It is to their interest to buy low and sell high, and although they are affected to some extent by market rates they themselves have much to do in regulating the market.

As regards the decline in the values of live stock, the Sub-Committee observe that the prices of cattle have been the most affected, and this they attribute largely to the abnormal development of the cattle-raising industry in Texas and the North-Western Territories, and to the conditions that have grown out of that business.

The depression of land-values is ascribed to two special causes, viz., debt and taxation. The indebtedness of American farmers has been, and now is, very heavy; the average *per capita* debt on real estate—farms and houses—for the entire country was, in January 1890, 21*l*. That is to say, the land mortgage debt owned by individual owners was equal to a debt of 21*l*. to each person in the United States. In respect of taxation, it is remarked that a large amount of personal property entirely escapes the payment of taxes, thus throwing a greater burden on the land. It is maintained that this unjust discrimination against real estate cannot fail to have a depressing influence on land values.

The other chief causes of the fall in prices, mentioned in the report, are the unfair discrimination in railway rates, and the monetary disturbances.

The Sub-Committee suggest several remedies, which they divide into three classes :—First, such as farmers can invent and apply individually ; second, such as farmers can bring about by association ; and third, such as can be supplied only by the aid of legislation.

With reference to remedies by association, it is pointed out that wherever farmers have associated themselves together for purposes of mutual improvement and have maintained their organisations, they have received mutual benefits. This has been abundantly demonstrated by the Patrons of Husbandry and like bodies of farmers who have made the business of farming a study. These associations, however, have not undertaken to unite in the conduct of large farming operations, nor have there been any syndicates made up of men who own and till small farms.

The remedies by legislation are separated into two classes :—State and national. By State legislation much, it is thought, might be done to relieve agriculture by keeping freight charges uniform and reasonable on State traffic, and by establishing a warehouse and grading system so that farmers may have convenient and common warehouse and elevator privileges.

Farmers and all classes of producers might also be helped by the regulation of the charges in all quasi-public institutions, such as mills and express companies, and by keeping charges of public officers within reasonable bounds.

But among remedies by State legislation perhaps none, it is considered, is more important than the equalisation of taxation.

Concerning remedies by means of national legislation, the Sub-Committee recommend an improved system of Government crop and market reporting ; the suppression of the business commonly known as dealing in “ Options and Futures ” ; and the consolidation of the transportation business, to the end that charges may be uniform in all parts of the country and that carriage shall not cost more than it is reasonably worth.

They also suggest the necessity of an improvement of the monetary system and financial methods of the United States, and recommend the restoration of silver coin to its ancient place as money ; the provision of an abundant legal tender national currency ; the abolition of banks of issue ; the establishment of public savings depositories ; the direct surveillance of all banks by the Government ; and a reduction of the rates of interest to a reasonable and uniform standard.

Two other recommendations are to the effect that the Government should be divorced from the moneyed interest, and that there should be a cessation of class legislation.

VII.—DAIRYING IN VICTORIA.

According to the Victorian Year-Book for 1893, the annual quantity of milk yielded by milch cows in Victoria is considered on the average not to exceed 290 gallons for each cow, or about four-fifths of a gallon per diem. The yield of cream usually varies from 8 to 15 per cent. (by measure), and that of butter-fat from $2\frac{3}{4}$ to 5 per cent. (by weight), which is equivalent to from $3\frac{3}{5}$ to $1\frac{4}{5}$ gallons of milk to every pound of butter; whilst 3·5 per cent. or 2·7 gallons to the pound of butter is considered a fair average, although in exceptional cases it rises as high as $5\frac{1}{2}$ per cent., equivalent to 1·6 gallons per pound. In the butter factories about 12 per cent. of cream, and $2\frac{1}{2}$ gallons of milk to every pound of butter—equivalent to nearly $3\frac{3}{4}$ (3·72) per cent. of butter-fat—is the usual yield; but it is asserted that the richness of milk sent to factories is below the average. It is estimated that to obtain a given quantity of butter, about 11 per cent. more milk is required by the hand skimming than by the separator process, and a further allowance should be made of, say, 6 per cent., to cover losses of cream in hot weather, hence it follows that it would take 2·9 gallons of milk, such as is used in factories, to produce one pound of hand-made butter. It is stated that the best results are obtained from cows fed on green feed in its natural state, or made into pit-chaffed ensilage. The following is an estimate of the quantity and value of the dairy produce of the Colony for 1892–3, based on returns furnished and on the assumed yield of milk:—

QUANTITY AND VALUE OF DAIRY PRODUCE OF VICTORIA,
1892–3.

Yield of Milk.	Gallons of Milk.	Value.
Consumed in its natural state, at 8 <i>d.</i> per gallon -	41,560,250	£ 1,385,340
Made into butter ($2\frac{3}{4}$ gallons to the lb.) = 27,036,300 lbs. of butter at 9 <i>d.</i> per lb. - - - -	74,349,830	1,013,860
Made into cheese (1 gallon to the lb.) = 5,071,250 lbs. of cheese at 6 <i>d.</i> per lb. - - - -	5,071,250	126,780
Total - - - -	120,981,330	2,525,980

The number of butter and cheese factories returned as being in operation in 1892–3 was 109, of which 86 were exclusively for butter, 14 for cheese only, and 9 for both products. The total number of establishments existing in the previous year was 74. The majority of the factories employed steam-power. The

number of hands employed was 360, whilst the capital invested in machinery, plant, lands, and buildings, was 174,098*l*. The quantity of factory-made butter was over 13 million lbs.; and of cheese 947,000 lbs.; but in addition to this 10,320,079 lbs. of butter and 3,110,463 lbs. of cheese were made on farms, which were not returned as factories, although they employed over 14,000 hands exclusively in dairy-work.

A considerable impetus has been given to the butter industry in Victoria by the bonuses granted by the Government, and the opening up of an extensive trade in that article—under the supervision of the Department of Agriculture—with the United Kingdom, to which country nearly 6½ million lbs. of butter, valued at 322,056*l*., was shipped in 1892, as compared with 3¾ million lbs., valued at 186,400*l*., in 1891.

The Victorian Department of Agriculture also undertook in 1889 to act as shipping agents for the butter exporters, and these duties it has since continued to perform under certain conditions as to packing and marking. Under this arrangement the butter is consigned to the Government butter expert at Newport accompanied by a way-bill stating the number of boxes and other particulars. The freight charged by the Department is 1¼*d*. per lb.

With the further object of assisting the dairy industry in preserving surplus butter during the summer season, the Department has made arrangements to store such butter in the Government refrigerating works at Newport, for any period not exceeding three months, free of charge to the owner of the butter. All expenses incurred in receiving and storing the butter and in working the refrigerating machinery being paid out of a grant of 37,000*l*. allotted by the Government of the Colony, in 1889, to provide bonuses in aid of fruit-drying and dairy factories.

As regards dairy factories, the bonus regulations provide that a sum of 100*l*. may be paid to any individual, association, or company owning a butter factory, or creamery, which during any period of 12 months produces butter or cream of good quality from not less than 26,000 gallons of milk in the 12 months. For each additional 1,300 gallons of milk handled in the 12 months an extra bonus of 5*l*. may be paid, but no payment may exceed 300*l*. in respect of butter factories nor 200*l*. in the case of creameries. These bonuses came into operation on June 30th 1889, for a period of six years expiring 30th June 1895.

VIII.—THE KESTREL OR WINDHOVER

(*Falco Tinnunculus*).

This beautiful and valuable bird is often wantonly killed either for the sake of shooting at something wild, and the pleasure of seeing it stuffed and set in a glass case, or because of an exaggerated idea on the part of gamekeepers that it is a systematic destroyer of young partridges and pheasants, grouse, hares, and rabbits.

The wholesale destruction of such birds as the Kestrel is frequently the main cause of abnormal and sudden attacks upon crops by animals and insects. In favourable condition of climate and other circumstances, and in the absence of the checks provided by nature, to their undue increase, certain animals multiply exceedingly and do infinite harm, as was exemplified by the serious injury occasioned to grass land in parts of Scotland by voles in 1892. Insects also appear more frequently and in larger numbers in these later days owing in a degree to the destruction of birds, their natural destroyers. As an example, it may be observed that the enormous decrease in the number of swallows on account of their alleged destruction, in their winter quarters, has, it is fully believed, been one reason for the swarms of aphides which now come upon the hop plants regularly every season. In their migration from the plum and damson trees, and other trees of the *prunus* tribe, these insects were formerly cleared off by the swallows. Now swallows are so reduced in numbers that they have little influence upon insect attacks.

The Kestrel prefers animals of the mouse tribe to all other forms of food. Yarrell, in his *History of British Birds*, says, "Mice certainly form the principal part of the food of this species." It also feeds on beetles, especially cock-chafers, and wireworms, the larvæ of click-beetles, and frogs. When it cannot get mice it will occasionally take very young birds, as pheasants, partridges, and grouse, but according to all observers it preys chiefly upon mice and insects; and in the report of the Departmental Committee, appointed by the Board of Agriculture to inquire into a plague of field voles in Scotland in 1892, it is stated that the food of the Kestrel is known to consist almost exclusively of mice, grasshoppers, coleopterous insects, and their larvæ.

Keepers do not always discriminate between hawk and hawk, and because other hawks, as the Sparrowhawk, for instance, take young game birds wholesale, it is often erroneously concluded that the Kestrel is equally an offender in this respect. In the report referred to above, it is observed, in connection with the question of the Kestrel's habits, that it is rare to find people able to distinguish between one kind of hawk and another. Few of



THE KESTREL OR WINDHOVER (*Falco tinnunculus*).

the witnesses, who gave evidence before the Departmental Committee, were able to describe hawks otherwise than as red, blue, brown, or yellow, and it was often found impossible to make out what species they intended to indicate.

If information as to the habits of the Kestrel were spread abroad, its identification would be easy on account of its practice

of hovering in the air, without motion, for a long time. Its graceful flight is also different from the rapid dashes of the Sparrowhawk. It is about fifteen inches from head to tail, the female being slightly smaller.

The colour of the Kestrel is from reddish-brown to fawn with black or bluish-black bars or spots on the back. The breast is also of lighter hue of fawn or chestnut. The beak of the male is blue. The female lays five eggs, about $1\frac{1}{2}$ inches long, mottled with reddish-brown. The young appear about the beginning of May, the nest being built on high rocks or old towers, and other old buildings and, as Yarrell says, sometimes in the nests of crows or magpies.

There is testimony from many writers as to the value of the Kestrel to the agriculturist as a mouse destroyer, notably from Charles Waterton and White of Selborne. In his recently published book, *Tierische Schädlinge und Nutzlinge*, Professor Ritzema Bos speaks of the great usefulness of the Kestrel (*Turnfalk*) to cultivators in Germany on account of its destruction of mice and insects. In France it is also highly valued. Brocchi, in his *Traité de Zoologie Agricole*, writes that the Kestrel (*crécerelle*) preys upon mice, rats and insects, and deserves accordingly to be protected.

IX.—POTATOES FOR STOCK FEEDING.

M. Girard has recently transmitted to the Board of Agriculture a paper containing the results of his latest researches into the meat-producing value of potatoes used for feeding stock.

Such use of potatoes has long been practised in France and elsewhere, but the actual meat-producing value of potatoes has not, in M. Girard's opinion, been sufficiently demonstrated.

For this reason M. Girard undertook a series of experiments with a view to determine the value of potatoes as fodder for cattle and sheep, his special object being to test their value in the production of meat.

Nine large bullocks, averaging 1,760 lbs. in weight, and 33 sheep were subjected to a series of experiments lasting from 28th November 1893 to 24th March 1894. The plan of research consisted of two completely parallel series of experiments, the one on bullocks, the other on sheep, each series comprising three lots of animals. Lot 1 received normal rations of beetroot and hay; lot 2 also received normal rations equivalent to that of lot 1, but consisting of potatoes and hay; lot 3 received a large ration of potatoes. Thus in the two first lots the meat-producing value of potatoes was tested and contrasted with that of beetroot, while the third lot exhibited the effect of a supply of potatoes in excess of the normal, and thus fixed the limits within which potatoes may be used with advantageous results.

In every case, excepting one to which reference will be made below, the potatoes were cooked. As regards the relative composition of the beetroot and potatoes, it was first ascertained that as regards dry weight of nutritive matter, any given weight of potatoes might be reckoned as equivalent in value to twice the same weight of beetroot. Subject to these conditions, the daily normal ration was fixed per head as follows:—(1.) For bullocks, 110 lbs. beetroot or 55 lbs. cooked potatoes, with 11 lbs. chopped straw, 16½ lbs. hay, and 10½ ozs. salt. (2.) For sheep, 8·8 lbs. beetroot or 4·4 lbs. cooked potatoes, with 1·1 lbs. chopped straw, 1·65 lbs. hay, and 10½ ozs. salt. In the larger ration the quantity of potatoes was raised to 66 lbs. for bullocks and 6·6 lbs. for sheep. The proportion of hay, chopped straw, etc., remained unaltered.

The bullocks were divided as evenly as possible into three lots, each containing three animals; in lot 1, their aggregate weight was 5,253 lbs.; in lot 2 it was 5,095 lbs., and 5,197 lbs. in lot 3. In order to clearly show the effect produced by potatoes upon the growth of bullocks, the three lots were kept separate for 61 days, each receiving the ration indicated above. Each bullock was weighed every week, and the following table gives

approximately the initial and final weights of each lot, and also the corresponding increase in live weight:—

Rations.	Weight of Animals.		Increase in Live Weight.		
	Initial.	Final.	Total.	Per Head per Diem.	Per cent. of Initial Weight.
Lot 1. Normal ration, beetroot and hay.	Lbs. 5,253	Lbs. 5,652	Lbs. 399	Lbs. 2·2	7·6
„ 2. Normal ration, potatoes and hay.	5,095	5,641	546	2·9	10·6
„ 3. Large ration, potatoes and hay.	5,197	5,804	608	3·3	11·7

The above figures, it is maintained, illustrate most strikingly the superiority of potatoes to beetroot in nutritive value. When the ration is normal, potatoes are said to have a decided advantage since they show an additional daily increase in live weight per head of nearly 11 ozs. When the ration is one-fifth richer in potatoes, this increase rises to 17 ozs. On the termination of the first experiment, the bullocks were subjected to a second experimental period, partly with a view to develop the maximum of meat, and partly to test whether those bullocks which had hitherto been nourished upon beetroot were capable of deriving sustenance from potatoes. With this object in view, eight of the bullocks were selected, and each animal received a mixed ration of potatoes and hay with an addition of 4·4 lbs. of oilcake per diem. This second experiment was of short duration, lasting only 28 days. In spite of a small accident, the results were sufficiently definite to show that each of the eight bullocks daily gained considerably in live weight for two weeks, but soon afterwards the improvement ceased. In fact, from the 24th February and during the two following weeks, it was observed that the rate of increase became decidedly less; hence it was inferred that the animals were at their prime and nutrition by potatoes might be considered to be complete. On the 10th of March this diet was stopped. The results recorded during the two experimental periods show that in 95 days the bullocks of lot 1, fed for 67 days on beetroot and 28 days on potatoes, increased in live weight only 2·09 lbs. per head daily. In 81 days the bullocks of lot 2 receiving normal ration of potatoes increased in live weight at the rate 2·86 lbs. per head daily. The bullocks of lot 3, which received for the same period the large ration of potatoes, increased in weight 3·52 lbs. per head daily.

The sheep were divided into three lots of 10 sheep each: lot 1 received the normal ration of beetroot and hay mentioned above: lot 2 received the normal ration of potatoes and hay;

lot 3 received the large ration of potatoes and hay. In the case of the foregoing lots the potatoes were always cooked before use; an additional lot consisting of only three sheep was supplied with a diet of uncooked potatoes. The ration of this lot comprised 6.6 lbs. potatoes and 1.65 lbs. hay. The results were as follows: lots 1 and 2, receiving normal diet containing in the one case beetroot, in the other potatoes, realised in 70 days the following increase in live weight:—

Rations.	Weight.		Increase in Live Weight.		
	Initial.	Final.	Total.	Per Head per Day.	Per cent. of Initial Weight.
Lot 1 (fed on beetroot) - -	Lbs. 836	Lbs. 923	Lbs. 87	Lbs. 0.124	10.4
Lot 2 (fed on potatoes) - -	854	1,022	168	0.239	19.6

From the above it appears that the increase of weight in the case of lot 2 was nearly double that of lot 1.

Referring now to lots 2 and 3, one of which received 4.4 lbs., the other 6.6 lbs. of potatoes per diem, and contrasting them with a view to determine the degree in which an increase of the starchy ration influences the increase in live weight, it was found that after 116 days these two systems of feeding furnished the following results:—

Rations.	Weight.		Increase in Live Weight.		
	Initial.	Final.	Total.	Per Head per Day.	Per cent. of Initial Weight.
Lot 2 (normal ration) - -	Lbs. 759	Lbs. 1,022	Lbs. 263	Lbs. 0.227	34.7
Lot 3 (large ration) - -	773	1,116	343	0.295	44.4

It seems, therefore, that, in 116 days, sheep of 77 lbs. weight each increased 34 lbs. in live weight. In other words, their weight had increased by nearly one half. As regards lot 4, which was supplied with potatoes in the raw state, by comparing that lot with lot 3 it was evident that the uncooked potatoes yielded results in every respect inferior to those obtained by the employment of potatoes which had been previously cooked. M. Girard thinks, therefore, that from the point of view of the

increase of the live weight of the animals, cooked potatoes should be regarded as a first class food both for sheep and cattle, and in any case as superior to beetroot.

But apart from the gross increase in live weight it was considered desirable to ascertain the actual net yield, and the quality, of the meat. In this respect the use of cooked potatoes is stated to have produced results exceeding all expectation. The net yield of meat rose on the average in the case of bullocks to 59·17 per cent. of the live weight. The bullocks in lot 2, which received normal rations, dressed to 60·19 per cent. The usual yield of meat from French bullocks is said to seldom exceed 53 to 56 per cent. of the live weight, so that the superiority in weight amounted to 3–6 per cent. on the live weight.

The sheep dressed to 51 per cent. of the live weight; the average dressed weight of the same lot of sheep before the beginning of the potato diet was only 41 per cent. of the live weight. A dressed weight for sheep exceeding 50 per cent. of the live weight is stated to be unusual.

As regards quality, the meat is reported to have been altogether superior, the flavour being rich and delicate. The experiment appears, therefore, to have been completely successful not only as regards the gross increase in live weight, but also as regards the net quantity, and the quality, of the meat obtained.

With reference to the question of cost, M. Girard estimates the net profit to have been approximately as follows :—

Rations.						Profit per Head.	
						£	s. d.
Bullocks fed on	{	Beetroot	-	-	-	1	16 3
		Normal ration	-	-	-	4	3 10
	{	Potatoes	-	-	-	3	4 11
Sheep fed on potatoes	{	Normal ration	-	-	-	0	4 5
		Large ration	-	-	-	0	3 11½

From this the conclusion is drawn that the normal ration furnished the most economic and most remunerative results. It is pointed out that in the case of both cattle and sheep there is a certain limit beyond which the additional increase in live weight entails so great an expenditure as to be economically inexpedient.

From the foregoing facts, M. Girard is of opinion that the potato when healthy and well developed must henceforth be regarded as a fodder yielding, in respect of the production of meat, remarkable economic results.

X.—EXPORT OF NORWEGIAN SHEEP TO ENGLAND.

The Annual Report of the Director of Agriculture, Christiania, contains an account of an experiment in the fattening of sheep for export from Norway to England.

The experiment, which was supported by a subvention from the Norwegian Government, was carried out, in the autumn of 1893, under the supervision of the Stavanger Agricultural Society. The conditions of the experiment received the approval of the Director of Agriculture. They provided that the animals selected for the experiment should weigh at least 100 lbs.; that the animals should be weighed at the beginning of the experiment and daily until its conclusion; that the fattening period should not be of less than six days' duration; that the animals should be fed in accordance with a scheme approved by the Department of Agriculture; that the fodder should be carefully weighed and recorded during the fattening period; that the meat of the animals should be sold in England; and that at the conclusion of the experiment a report of the results, with a statement of exact weights, should be furnished to the Council of the Agricultural Society.

The table of the fodder prescribed for the sheep per day per 100 lbs. live weight comprised $1\frac{1}{2}$ lbs. meadow hay, 10 lbs. of turnips, $\frac{1}{4}$ lb. linseed cake, and $\frac{1}{2}$ lb. of oats. On this ration 120 sheep were fed for various periods, ranging from six to ten weeks. Three separate lots fed with the prescribed fodder for 42 days showed an average increase in live weight per head of 15 lbs., $17\frac{1}{2}$ lbs., and 23 lbs. respectively, while the average augmentation in live weight per head of three lots of animals fed with the same ration for 10 weeks was 21 lbs. Eighty of the sheep were sent alive to England in October, and are stated to have been sold at satisfactory prices. The remaining 40 animals were slaughtered on November 30th, and the carcases, with the skins, hoofs, hearts, lungs, and livers intact, were despatched to England, where the mutton realised an average net price of $4\frac{1}{4}d.$ per lb. The offal of each carcase was sold at an average price of $11\frac{1}{2}d.$, but for the skins, which should have fetched 4s. $0\frac{1}{2}d.$ each, only 1s. $11d.$ was obtained, as they had been badly packed and were consequently damaged. The freight by sea and rail after leaving Stavanger, together with the market commissions, amounted to 5s. $5\frac{1}{2}d.$ per head. To this must be added the expenses of slaughter, packing, and transport in Norway, which amounted to 1s. $5\frac{1}{2}d.$ per head, so that the total expenses connected with the marketing of the animals amounted to 6s. $11d.$ per carcase.

It is stated that the experiment has shown that it is remunerative to fatten the sheep in Norway and send them alive to England. The average price of the 80 live animals before fattening was 18s. 6*d.* per head, the cost of fattening for six weeks was 8s. 3*d.*; the total outlay being 26s. 9*d.* per head. The sheep sold in England at an average price, after deducting commission, of 30s. 5*d.* per head, leaving a profit of 3s. 8*d.* on each animal.

The results of the sales of the 40 carcasses of mutton are said to have proved less satisfactory, there having been an average loss of 10s. per head. This, however, is partly explained by the damage to the skins referred to above, and by the circumstance that the vessel in which the carcasses were despatched arrived too late for the animals to be sold on a Tuesday.

On the whole, the Council of the Stavanger Agricultural Society conclude from the experiment that mutton can be remuneratively sent to England from Norway in the winter, that the offal, hoofs, heart, lung, and liver should accompany each carcase, that the skins might also be sent, and that it would be advisable to send fat sheep alive to England so long as the British markets are open to receive live animals from abroad.

XI.—CROP PROSPECTS ABROAD.

CROP PROSPECTS IN THE UNITED STATES.

The latest reports of the Statistician of the Department of Agriculture of the United States furnish the following particulars as to the condition of crops in that country :—

The preliminary returns of the acreage of maize showed 106 per cent. as compared with the acreage of 1893, this being an increase in round numbers of 4,000,000 acres, or from 72,000,000 to 76,000,000 acres. The average condition in August was 69·1, there having been a decline of 26 points since July 1st.

The advices received in August from correspondents and threshers respecting winter wheat indicated a good yield of excellent quality. The condition of spring wheat in August was 67·1, against 68·4 in July, a decline in condition of 20 points since June. The average per-centage of acreage for both spring and winter wheat for the whole country was returned as 95·3, making the total area under wheat about 33,000,000 acres.

The condition of oats was reported in August to be 76·5. Last year the condition of the crop on August 1 was 78·3. Over large areas the crop this season was injured in many localities by spring frosts, and injuries from drought have been still more numerous. There were also many complaints of rust, blight, and the depredations of aphides and other insects.

In July barley had declined about six points since the report of the previous month, and on August 1st it stood at 69·8. Over two-thirds of the entire crop of barley is grown in five States. Of these California is the principal, producing a fourth of the entire product.

The condition of rye on August 1st was 79·8 as compared with 87 a month earlier.

The acreage of potatoes is returned as 105·1 of last year's area, making the area under the crop this season about 2,738,000 acres. One of the chief causes of the general increase of the surface planted with potatoes is stated to be the extremely low price of cereals during the past twelve months. A number of localities reported serious damage from drought, while others complained of the unusual virulence of the Colorado potato-beetle. The condition of the crop on August 1st was 74. Last year at the same date the condition was 86.

The hay acreage is given as 92·4 per cent. of that of 1893, or 45,843,000 acres as compared with 49,613,000 acres last year. The condition of the crop was returned as 75·6 on August 1st, a decline of nearly five points from the previous month. Drought and freezing are said to be the chief causes of the low general

average, though other causes have contributed to the reduced condition in various districts.

The average per-centage condition of apples was reported on August 1st as only 44, denoting a very meagre crop. In a few localities the conditions pointed to a crop ranging from fair to good; but in most of these the fruit was said to be dropping badly, and a further reduction of the per-centage was expected. In a few States there were prospects of half a crop, but in the remainder, many of them States of large production, the percentages were so low as to leave no doubt of the failure of the crop within their respective boundaries.

The outlook for peaches pointed to a practical failure of this crop, the average condition for the whole country being but 22·3 per cent. On August 1st, in California, however, the peach crop was reported to be in fine condition.

As regards the wool clip, the returns indicated on July 1st an average weight per fleece of 5·33 lbs., as against 5·3 lbs. last year. The variation by States is considerable, ranging from $2\frac{1}{2}$ lbs. per fleece in Alabama to $7\frac{1}{2}$ lbs. in South Dakota. The chief causes of this difference were reported to be varying climatic conditions, and different degrees of care bestowed on the stock, as well as the keeping of widely varying grades of animals, from the highest grade blooded stock down to the common native breed.

CROP PROSPECTS IN ONTARIO.

The Ontario Department of Agriculture issued, on June 22nd, a bulletin on the condition of crops in that province. The report stated that the fall wheat crop had stood the heavy rains and changes of weather much better than the spring crops. Throughout the entire province some low lands had been flooded and the crop drowned out. On very heavy clays there had been some damage, but on light and loamy soils very little injury had resulted. The reports from all parts of the province were practically to the same effect, viz., that after the rain, the wheat soon recovered, and showed less injury than had been supposed. No more than usual had been ploughed up and resown. Heading out was in progress on the 15th June. In some places the growth was quite rank. With a continuance of favourable weather a good crop of fall wheat was expected; at the date of the report the conditions promised an average yield.

As regards spring wheat, the low-lying lands were reported to have suffered severely, but the higher lands had fair crops. The grain had been sown in fine condition, and was recovering

rapidly from the extra rain. On the whole, the indications at the end of June were for a crop about two-thirds of the average. Barley had suffered quite extensively from the rain, and was backward in growth, but at the date of the report it was making very rapid progress, and with a continuance of favourable weather will probably come up to nearly the average of the last two years.

The oat crop was making a very rapid growth, and becoming somewhat rank in straw. The crop was, on the whole, somewhat more backward than usual, but there were indications that the yield would be fully up to the average.

The continued rains did more damage to peas than to the other spring-sown crops. Early sown peas had done well on high lands, but on low lands they had suffered heavily.

Early planted beans, especially in gardens, were cut off by late frosts. Most of the crop had been put in late. The acreage will, therefore, probably be below the average.

A small amount of timothy was winter-killed, but the principal damage resulted from some cold, wet days of spring and early summer. The reports from all counties were in agreement that there will be a short hay crop this year. The prospects were for a crop of about two-thirds that of 1893.

On the whole, the clover crop promised to be below the average. Damage by insects was reported from a few counties.

Early planted potatoes were much injured by frosts, and large quantities rotted in low lands. Late planted potatoes were coming on well.

The frost had done some damage to fruit. Peach trees were injured to some extent by frost, and "leaf curl" was reported from many districts. There was promise of only a fair crop. Apples were setting well, and, on the whole, promised a good crop, especially east of Toronto. Pears were in good form. Plums and cherries were reported to be fair. Small fruits gave prospects of good yields.

According to the *Canadian Gazette*, advices received from Ontario early in August stated that the crop of wheat was a fair average, and oats had given an excellent yield except on light lands, where they had suffered from drought and late sowing. The hay crop in West Ontario was reported to be inferior in quantity, but superior in quality, to that of last year.

CROPS AND LIVE STOCK IN MANITOBA.

The June bulletin, published by the Department of Agriculture and Immigration, Manitoba, gives the area under wheat in 1894 as 1,010,186 acres, compared with 1,003,600 acres in 1893; oats

were sown on 413,686 acres, or 24,000 acres more than in the preceding year, while barley covered 119,528 acres as compared with 114,762 in 1893. The acreage under cereals in the different districts is shown below :—

District.	Wheat.	Oats.	Barley.
	Acres.	Acres.	Acres.
North-western - - - -	68,938	72,648	13,522
South-western - - - -	395,500	123,516	21,600
North central - - - -	214,736	73,874	25,468
South central - - - -	280,612	99,648	39,738
Eastern - - - -	50,400	44,000	19,200
Total Province - - -	1,010,186	413,686	119,528

The acres sown with potatoes and root crops are stated to be 13,300 and 7,880 respectively. But these figures are approximate only, for in many cases these crops had not been planted or sown when the reports were sent in. There is a great increase in the area under flax.

The amount of wheat held for sale by farmers in June was, it appears, inconsiderable, being not more than 140,000 bushels, of which nearly one-half was held in the south central and one-fourth in the north central districts. Reports from the north-western districts showed practically no wheat at all in farmers' hands beyond what was required for home consumption.

Nearly 9,000 head of cattle were fed for beef during the winter.

The condition of meadows and pastures was reported as "good," "never better," and "a good bit earlier than usual."

Over 20 townships were considering the advisability of starting a cheese factory or creamery.

According to the *Canadian Gazette*, of August 23rd, the latest mail advices report that the wheat crop in Manitoba and the North-West is expected to yield an average of fifteen or sixteen bushels to the acre. In some districts in Manitoba the yield is confidently put down at twenty to thirty bushels per acre, and in Northern Alberta the crop promises to be quite as heavy as it was last year. Reports from the Regina district, however, state that the average yield will be small.

THE WHEAT CROP OF INDIA IN 1893-94.

The Board of Agriculture have received from the Department of Revenue and Agriculture of the Government of India a copy of the final memorandum on the wheat crop for the season ending 31st March 1894.

The harvest is stated to have varied considerably in different parts of India, being decidedly bad in the Central Provinces,

excellent in the Punjab, and moderate elsewhere. The plentiful rains of last summer and autumn, though in some tracts excessive, were, as a general rule, favourable to sowings, but the weather subsequently experienced differed considerably in the various provinces. In *Bombay* and *Berar* the conditions varied largely from district to district; in some places damage was caused by blight and want of rain, in others by rust and excess of rain, and in others again by frost, hail, or rats; the normal area, however, had been put under wheat, and as there was more success than failure the general outturn was above the average in both provinces. The acreage sown in the *Central Provinces* was slightly below normal, and as the crop suffered severely from heavy rain in November the produce only reached half the usual standard on the acreage sown, and only yielded an aggregate outturn of 69 per cent. of the ordinary average of the province. In the *Jubbulpore* district of this province the outturn was only one-third of the normal, while in two other districts, *Saugor* and *Damoh*, the whole crop of wheat—the staple food of the districts—was such a complete failure that steps had already been taken to meet local distress.

In *Bengal* the cultivation of wheat appears to be yearly extending, but the outturn of the year, which otherwise would have been good, was reduced by a rainless winter to some three-fourths of a full average. In the *North-Western Provinces and Oudh* the area sown was large, but the crop, which promised well till the end of January, was much damaged by subsequent high winds and rust, which had brought about a poorer yield than has been known for many years. In the *Punjab* even the enormous area sown in 1892 was exceeded by 17 per cent. in 1893, and it is difficult to imagine a year more favourable to the province as a whole. The outturn was 16 per cent. above that of last year and 40 per cent. above the normal. The grain stores are full to overflowing, and competent judges state that no such crop has been known for 20 years.

The outturn in India generally is reported to have been above average, although, in consequence presumably of heavy crops in Europe and America, the exports from India have been abnormally low.

Only 608,000 tons of wheat left the country during the 12 months ending 31st March 1894, against 749,000 tons in the preceding 12 months, and the proportion of exports to outturn is estimated at 8·8 per cent., against 22 per cent. and 14 per cent. in the previous two years. Though there was a slight rise in exports from the Punjab and in the imports to Eastern Oudh and Bihar, the trade between province and province was, generally speaking, very dull, and the great failure of the harvest in *Saugor* and *Damoh* produced little effect on its course. The decline in the export trade and the general abundance of the harvests have combined to keep prices at a very low figure, and even in those districts where the crop was a more or less complete failure prices remained moderate.

The following table shows the acreage and yield of wheat in the several provinces :—

Province.	Acreage. 000 omitted.			Yield. 000 omitted.		
	Of Crop of 1893-94.	Of previous Year's Crop.	Normal, i.e., Average of —Years.	Esti- mated Yield of Crop of 1893-94.	Yield of previous Year.	Normal, i.e., Average of the pre- ceding —Years.
Punjab - - - -	Acres. 8,265	Acres. 7,020	Acres. 6,569	Tons. 2,560	Tons. 2,213	Tons. 1,817
North-Western Provinces and Oudh.	4,897	4,641	4,868	1,473	1,844	1,662
Central Provinces - -	3,927	4,197	4,090	600	762	871
Bombay - - - -	2,479	2,475	2,511	755	654	663
Sind - - - -	539	604	507	164	204	171
Berar - - - -	928	985	892	94	76	90
Bengal - - - -	1,584	1,559	1,844	461	466	745
Rajputana - - - -	1,646	1,604	1,562	389	431	413
Central India - - -	361	429	399	64	61	65
Kashmir - - - -	31	31	31	8	8	8
Rest of India - - -	2,725	2,884	3,461	355	474	471
Total - - - -	27,382	26,429	26,734	6,923	7,193	6,976

The statistics shown for Central India are for five agencies only. The figures for Kashmir are approximate.

CROP PROSPECTS IN AUSTRIA.

Quoting from the official reports of the Austrian Ministry of Agriculture for the middle of July, the *Wiener Landwirthschaftliche Zeitung* states that cold, rainy weather was generally prevalent throughout the greater part of Austria until the middle of June. But towards the end of that month the weather improved, and the temperature rose considerably in the Alpine as well as in the North-western Provinces, where beautiful weather prevailed, with or without occasional thunderstorms, and continued until the date of publication of the estimates.

Nowhere was the benefit due to the warm weather more conspicuous than in the fields of rye. The rye-harvest began almost simultaneously with the finer weather in the south, in the central districts, and in the warmer parts of Moravia. In the southern belt almost the whole of the rye was harvested, as was also a considerable portion in the central districts.

Straw was generally speaking abundant, and as the ears, were for the most part long, and the grain well developed, the rye harvest as a whole was expected to yield an average perhaps even a good, crop. The quality of the grain was also satisfactory.

In the case of wheat, the flowering season was more propitious. In the south this occurred partly before the commencement of the rainy period; in the north-west chiefly during the succeeding fine weather. Partly for this reason, and partly owing to its thicker growth, the harvest prospects were better in the case of wheat than in that of rye. Rust was said to be prevalent in many districts, and blight had made its appearance in a few isolated localities. Amongst pests which retarded germination, reference is made to the ribbon-footed corn-fly, *Chlorops taniopus*, which had appeared in the north-west, especially in Silesia, while the Hessian fly, *Cecidomyia destructor*, had done some damage in the west of Galicia. Under these circumstances the wheat crop in general might, with the exception of Galicia, be reckoned as a good average, while in Galicia it was barely up to average. In the southern districts the wheat-harvest had already commenced.

Barley and oats had upon the whole a very good appearance.

Maize promised to be a fair crop, although growth was retarded by the long spell of rain in June. As regards millet, unsatisfactory accounts came from Carinthia, Bohemia, and Galicia. Potatoes seemed likely to yield a good crop, although they were partially injured and rotted by the wet, and the disease had attacked them in many districts. Early potatoes especially suffered in this way.

In the case of roots, work had been delayed by the long period of rain.

Turnips and cabbages were, generally speaking, good. The latter had suffered somewhat from cockchafer-larvæ and turnip flea.

For haymaking the bright weather came exactly at the right time. Consequently the hay-crop was very good in most cases, while in others it was slightly damaged. The quantity was upon the whole satisfactory, and even abundant, especially in Steiermark, Carinthia, Carniola, and north-eastern Bohemia. The clover fields also yielded a good crop of hay.

Of flax extremely good accounts came from the Alpine and Western districts, as well as from Bukovina, though those from the latter province were not quite so good.

In the case of vines, flowering took place to a large extent in the rainy period, consequently the vintage will not be very good, especially as it has also been unduly delayed.

Amongst fruit-trees the falling off of the newly-set fruit continued throughout the period referred to in the report, so that

the prospects were not so good as they appeared to be immediately after flowering. The failure of the damson crop has been a standing source of complaint. Especially bad were the reports regarding the whole of the fruit-crop in Galicia ; but a good crop was anticipated, at any rate in some kinds of fruit, in many parts of the crown lands, especially in Steiermark and Moravia.

As regards olives, various reports were received from Dalmatia, to the effect that upon the whole the yield would be an average one, while similar hopes were entertained in Istria, where appearances were very promising.

CROP PROSPECTS IN DENMARK.

The *Berlingske Tidende* of August 11th stated that in the more southerly districts of Denmark, where the summer has been dry, the grain is reported to have ripened with surprising rapidity, and harvesting was proceeding in the first week of August. A large area of rye had been harvested in good condition in Jutland and the islands.

In North Zealand and Lolland the rye had been injured by the rains, and the yield is said to have been very unsatisfactory in some districts.

As in the case of rye, the other cereals had ripened much earlier than was expected, and the harvesting of wheat, barley, and oats was proceeding everywhere at the date of the report.

Roots were badly in want of rain in many districts ; meadows and pasturage were also reported to be backward, and in need of a few heavy showers.

CROP PROSPECTS IN FRANCE.

Estimates published by the French Ministry of Agriculture, in the *Journal Officiel* on July 10th, indicated the condition of winter wheat at the beginning of the month to be good or very good in seventy-two departments, fair in twenty-eight, and moderate or bad in twenty-eight. In the departments growing spring wheat the crop was reported to be good or very good in thirty-two, fair in four, and moderate or bad in four. Rye was reported to be good or very good in seventy-six departments ; in sixteen it was considered fair, and in eight moderate.

Oats were estimated to be good or very good in sixty-five departments ; in seventeen fair, and in four moderate or bad.

The condition of barley was reported to be good or very good in sixty departments ; in sixteen it was fair, and in four moderate or bad.

Potatoes in sixty-seven departments were good or very good; in eighteen fair, and in one moderate.

Later advices published in the *Journal d'Agriculture Pratique* were to the effect that at the beginning of August the wheat harvest promised to be one of the best reaped for some years. Beetroot and potatoes also looked well. The vintage seemed almost as plentiful as in 1893. There was abundance of fodder. The crops as a whole contrasted very favourably with those of last year.

CROP PROSPECTS IN GERMANY.

The Board of Agriculture have received from the Imperial Statistical Bureau, Berlin, an official report on the condition of the crops in Germany in the middle of July last, and a later report, for Prussia only, dealing with the condition of the crops in August.

Winter and spring wheat were reported to be moderately good; rye promised to be an over-average crop, and barley and oats were only slightly inferior to rye. The August report for Prussia stated, however, that rye had not come up to the expectations of the previous month and that, the yield of grain would be much below that of last year.

In some districts of South Germany the winter-sown grains were more or less damaged by heavy rains in the first fortnight of July, and in various localities the wheat was affected with rust. Complaints were also not infrequent of injury done by the Hessian fly and the frit fly. In the Province of Posen the wheat-fields presented a particularly unfavourable aspect, and in Prussia generally the wheat crop was reported in August to be far from satisfactory.

Spring-sown grains were looking well. In Central and South Germany barley and oats were laid in many districts by the hail and rain storms. Weeds were a subject of complaint in several localities. In Prussia barley had been got in in good condition in the Eastern provinces, but it was much injured by rain in the west. Oats were reported to be a good crop in Prussia.

Potatoes were on the whole reported to be strong and healthy in July, but according to the August report a full crop is not expected in Prussia. Peas were nearly everywhere in Prussia affected with powdery mildew, and it was feared that, in spite of their otherwise good condition, the yield would be small.

A special inquiry was made as to the condition of orchards in the Prussian provinces, and out of 2,651 correspondents 1,708 reported that the production of fruit was not likely to

exceed the local requirements, while 639 stated that there would be a surplus after supplying the local demand.

CROP PROSPECTS IN HUNGARY.

In the July reports on Hungarian crops, published in the *Foeldmivelesi Ertesito* by the Minister of Agriculture, it is stated that the area under wheat this season amounts to some 7,600,000 acres, with an average yield varying from 22 to 26 bushels per acre. Harvesting had already commenced at the date of the report. Much damage was reported to have been done by the Hessian fly, but the grain was said to be well developed and of good quality. The area under rye was estimated at about 3,300,000 acres, the average yield varying from 22 to 26 bushels per acre, while the grain was reported to be well developed and of good colour.

Barley was said to occupy more than 2,500,000 acres, the winter barley being reported to be of good quality, though slightly damaged by blight, the yield being 26 to 32 bushels per acre; while the crop of summer barley was considered inferior to that of last year, the yield being only 26 to 28 bushels per acre. The area under oats was estimated at about 2,400,000 acres, and the yield at about 34 bushels per acre. The rye crop was reported to be, generally speaking, satisfactory, and in some districts good. Maize, millet, and buckwheat were also reported to be in a satisfactory condition. The third cut of clover and lucern gave a moderate yield and good aftermath.

Serious damage was caused by drought in July to root crops, garden vegetables, and hay. The crops of vegetables, hemp, and flax were reported to be poor, as were also those of roots and sugar beet, owing to damage by insects in the spring. Tobacco and potatoes had also suffered somewhat, but tobacco had partially recovered, while the potato crop seemed to have sustained permanent injury, especially in the northern districts. The vintage, although suffering from the effect of the drought, was reported to be in a satisfactory condition, while the fruit crop was stated to have been severely damaged by the storms of 11th July.

CROP PROSPECTS IN ITALY.

The *Gazzetta Ufficiale* of July 28th publishes a report issued by the Central Office of Meteorology at Rome on the condition of the Italian crops. As regards wheat it is stated that threshing is going on everywhere, and the crop is good and abundant.

in Northern Italy, but it varies, and is on the whole mediocre in other parts of the kingdom.

Buckwheat is reported to have suffered from drought in Piedmont, Emilia, and some other provinces, but the crop promised to be abundant in the mountainous districts of the South and in some parts of Central Italy, where sufficient rain had fallen. Vines were generally healthy and promising. There had been heavy damage by hail in the province of Brescia.

Grasses were suffering from drought, except in Lombardy and Venetia and the greater part of Liguria.

CROP PROSPECTS IN THE NETHERLANDS.

The *Nederlandsch Landbouw Weekblad* publishes a series of reports on the condition of the crops at the beginning of August in the Netherlands. At that date rye and oats in the province of Utrecht promised an abundant yield, and wheat was expected to be over the average crop. Peas and beans were calculated to be a full crop. The outlook for hay was promising and an abundant yield was anticipated, with favourable weather for getting in the crop. Potatoes were doing well everywhere, except in districts where disease was prevalent. As regards orchards, pears were reported to be much above the average, but apples were on the whole poor.

In North Brabant all the cereals were stated to be well over the average, and peas and beans promised a good yield. Potatoes were free from disease and an abundant crop was expected. Hay was calculated to yield an over-average crop. Fruit trees were laden with fruit, and pears were especially promising.

Wheat and barley are little grown in Friesland, but both these and the remaining cereals, as well as beans and peas, were reported to be quite up to the average. Potatoes were on the whole excellent, but the early varieties had suffered from frosts, and the disease had made its appearance amongst them in some districts.

Hay was reported to be doubtful, the crop varying very much in different districts. Mice and caterpillars have done much injury to pastures here and there.

CROP PROSPECTS IN POLAND.

Mr. H. Grant, Her Majesty's Consul-General at Warsaw, writing on July 30th as to the harvest prospects in the kingdom of Poland, stated that the prospects were at that date, generally speaking, very promising. This was especially the case with regard to spring crops, an unusually fine yield of oats being anticipated. The rye harvest had commenced under favourable conditions in most of the Governments.

In most of the ten Governments winter crops promised well, although growth had been retarded by rain and wind, whilst in

the Governments of Lomza, Kielce, and Lublin hailstorms had inflicted damage estimated at nearly 2,000*l.*, and in that of Siedlce the crops suffered from spring frosts and a drought in May. Damage was in this way done to both wheat and rye.

Spring crops also suffered from the same causes, but were still very promising up to August, with the exception of buckwheat and millet in the Government of Kalisz.

Oats and barley were reported to be splendid in the Government of Warsaw. The root crop was in good condition everywhere.

Grass grew well, but the quality of the hay was severely deteriorated by rain. Floods occurred on the left bank of the Vistula, and in many districts of the Government of Lomza caused the loss of the entire crop of hay, whilst the hay was also to a large extent spoilt in the Governments of Kielce, Lublin, and Siedlce.

Potatoes also suffered from the rain in June, but favourable accounts of them were subsequently received from all districts except the Government of Piotrkow.

CROP PROSPECTS IN ROUMANIA.

According to the *Curierul Financiar* of August 5th, harvesting and threshing were proceeding at that date everywhere in Roumania under the best possible conditions. Wheat was of good quality, but maize had not fully developed owing to the effects of the drought, and in some districts it was feared the crop would be twenty per cent. inferior to that of last year.

CROP PROSPECTS IN RUSSIA.

Mr. J. Michell, Her Majesty's Consul-General at St. Petersburg, writing on August 17, states that according to a statement published by the Russian Department of Agriculture the rye crop is expected to be above the average over a considerable area of the black soil provinces, and a good yield is looked for in the other provinces of the Russian Empire. An average crop of winter wheat is anticipated, but the general yield is likely to be under the average in consequence of diminished sowings in many districts, especially in the south. Spring-sown crops are expected to prove almost generally good, with the exception of maize, millet, and buckwheat, which were injured by rain in some parts. Oats, barley, and peas promised well. Spring wheat will furnish an average yield. There has been a good hay crop.

The British Vice-Consul at Helsingfors reports that in Finland the chief crops were on the whole very promising and unusually early. The harvest may now be considered as secured. The hay crop in Finland was an average one, both in quantity and quality.

XII.—INJURIOUS INSECTS AND FUNGI.

POTATO DISEASE.

The Board of Agriculture think it desirable to give further publicity to the methods which the various experiments reported upon in the Papers [C.-6647 and C.-7138] laid before Parliament in 1892 and 1893, indicate as likely to be useful in checking the spread of potato disease.

Description of the Fungus.

The fungus which causes this potato disease belongs to the family designated *Peronosporæ*, and is recognised specifically as *Phytophthora infestans*. It attacks the potato plants by means of conidia, or microscopic spores, conveyed either by the wind, by insects, dogs, rabbits, hares, foxes, and by human beings, or by means of spores from the mycelia, or vegetative centres, generated within the growing plants, and coming from infected tubers. In very dry summers, like that of 1893, there is, as a rule, but little disease. On the other hand, it has been observed that the fungus has made rapid progress in a night temperature of from 47° to 50° Fahr. and a day temperature ranging between 57° and 59° Fahr. Generally speaking it may be said that the potato disease is generated, and causes more or less serious injury, in warm, showery weather, especially after electrical disturbances, and makes its appearance between the 25th of June and the beginning of August.

The first indications of the disease to casual observers are brown spots on the upper surfaces of the leaves. These are caused by the action of the spores of the fungus which have penetrated the under surfaces of the leaves and set up unhealthy action throughout the leaf-structure. On these under surfaces, congeries, or groups, of white silky threads have been formed, from which spores are rapidly generated and distributed by the wind, or other agencies, to infect other potato plants. It is therefore most important to prevent, if possible, the spores from germinating. If this cannot be done, steps should be taken to arrest their progress, to prevent them from forming vegetative centres from which may be generated countless quantities of spores, as well as root-like hyphæ which, by permeating the leaf tissues, and stalks, cause premature decay, and finally descend to the tubers, making them unsound.

Means of Prevention and Remedies.

A review of numerous experiments carried out during the last few years in Great Britain and Ireland, and in many foreign countries, makes it clear that the treatment of the plants

with compositions of sulphate of copper and lime has been employed preventively with satisfactory results in most cases in seasons of disease; but the treatment has not an unbroken record of success, and in a few instances the application of these compositions to potato plants has even appeared to have an injurious effect upon the yield.

On the whole, however, there is ample evidence to prove that potato-plants dressed with sulphate of copper compositions offer much more resistance to the attacks of the potato-disease fungus than plants not so treated. It has also been demonstrated that when potato-plants have been attacked by this fungus, the treatment with sulphate of copper compositions has proved remedial in a considerable degree, and has in many instances arrested the progress of the disease.

M. Girard—the greatest authority upon this subject—observes that it is most imprudent to wait until disease has appeared before the sulphate of copper compositions are applied, because the fungus spreads with such rapidity in favourable circumstances, that the cultivators have not time to organise and carry out defensive measures. Treatment should be adopted as a means of prevention, even if there may not be actual disease. In short, treatment is insurance against disease; but it must be remembered that the results, both preventive and remedial, depend in a very great degree upon the time and manner of application, as well as the nature, preparation, and distribution of the compositions.

Compositions.

The most commonly adopted composition consists of—

20 lbs. of sulphate of copper.

10 lbs. of lime.

100 gallons of water.

This has been found strong enough for all purposes, and does not injure the foliage if it is properly and evenly distributed, and not applied to very young plants.

A weaker composition is sometimes used, made of—

15 lbs. of sulphate of copper.

7½ lbs. of lime.

100 gallons of water.

This is preferred by some observers, especially for potato-plants whose leaves are young and tender. In experiments in Ireland last year, it was found that this composition was not so effective for treating Champion potatoes, whose leafage is coarse, as that made with 2 per cent. of sulphate of copper.

Another composition is advocated by M. Girard, consisting of—

20 lbs. of sulphate of copper.

20 lbs. of lime.

20 lbs. of molasses.

100 gallons of water.

The superior advantages of this composition have not been seen in this country, but in wet seasons the molasses would probably make the sulphate of copper adhere better to the leaves.

Preparation of the Compositions.

The sulphate of copper should be pure. Ordinary commercial sulphate of copper contains a large per-centage of sulphate of iron, which diminishes the action of the sulphate of copper and makes the composition of a dirty green colour.

The lime must be of the best quality, well burnt and unslaked.

The sulphate of copper, roughly pounded, should be dissolved in cold water in a wooden or copper vessel. A good plan is to put it in a coarse canvas or sacking bag, and let this hang over the side of the vessel in the water.

The lime must be slaked with cold water in a separate vessel, and the mixture, when cold, poured into the vessel containing the sulphate of copper, and passed through a fine sieve to exclude grit and other foreign matter. The whole should then be well stirred. A bright blue liquid is the result if the solution has been properly made.

The tubs, pails, and other vessels in which sulphate of copper compositions, which are poisonous, have been put must not be used for feeding animals.

Distribution.

On small areas, distribution may be effected by knapsack machines holding about 3 gallons. There are several kinds of these obtainable at moderate prices. A man can spray from one-third to half an acre per day with a machine of this kind.

Upon large acreages of potatoes a horse-machine would be required. With this from 8 to 12 acres can be sprayed per day.

The quantity of dressing applied usually varies between 110 and 150 gallons per acre.

Care must be observed to ensure regular distribution by means of fine spray-nozzles attached to the machines, which can be easily adjusted in different directions to cover evenly the upper and under surfaces of the leaves. Though opinion is sharply divided as to the necessity of spraying the under surfaces of the leaves, it is certain that the disease is first generated there, and it would seem to be even more important to apply preventive measures to the under surface of the foliage than to the upper surface.

Distribution will be materially assisted by strainers fitted into the machines, and by keeping the compositions constantly stirred.

If the dressing has been regularly and properly distributed, the leaves above and below should when dry be covered with bright blue spots.

It may be necessary to spray the plants again if heavy rains should fall and wash off the dressing.

If the disease still spreads after the treatment, it will be desirable to repeat the spraying.

Cost of Treatment.

It has been stated that the cost of treatment usually varies from 8s. 6d. to 11s. per acre for each application of the 2 per cent. of sulphate of copper composition. The composition with the molasses costs from 10s. 6d. to 13s. per acre.

THE BEAN APHIS (*Aphis Rumicis*).

Among the many species of aphid that infest and spoil cultivated crops, the bean aphid was much in evidence during June and July in bean-fields here and there throughout the country. Some cultivators of beans said that the plants had splendid haulm and blossoms, but complained that they were smothered with insects. In certain districts this aphid is called the "black dolphin."

The quantities of aphides congregating upon the stems and among the blossoms checked the formation of beans by continually exhausting the juices of the plants.

The winged female aphid is black and somewhat shiny. The larvæ—lice—are at first of a lighter colour, but they soon become black. When the food supply on the beans ceases, winged generations are evolved, which fly to weeds, such as docks, thistles, borage, and to furze, broom, and other plants, upon which continuity of existence is maintained during the winter.

With respect to modes of prevention and remedies, it is obvious that docks and thistles should be kept under as much as possible.

When it is noticed that beans are infested with aphides, the tops should be cut off. They generally first appear near the tops of the plants and gradually descend. It is a good practice to cut off the tops of the beans during flowering, but when these are infested they must not be left upon the ground, or the aphides will crawl up the adjacent stems.

In gardens and market-gardens infested beans may be advantageously sprayed with a soft soap and quassia solution in the proportion of 5 or 6 lbs. of soft soap, and the extract of 5 or 6 lbs. of quassia chips, to 100 gallons of water. It would be difficult to spray on a large scale, but it is an effectual process.

THE MANGEL FLY (*Anthomyia Betæ*).

Several complaints were received in May of attacks of the mangel-fly. These attacks were unusually early. Though the mangel-plants were very forward, in common with most vegetation, the date of the appearance of the larvæ within the tissues of the leaves was somewhat abnormal. Many were found before the plants had been singled, and it was feared that a bad attack was imminent. But seasonable showers forced the plants along rapidly, and the climatic conditions were apparently not suitable to the spread of this pest, so that it has not caused much harm this season.

It was observed in connection with this attack that the flies laid eggs upon the weed known as "fat hen" or "goosefoot," *Chenopodium album*, L., which was growing abundantly among mangel-plants on land that had been heavily manured with farm-yard manure. These weeds were carefully watched, but it could not be discovered that the larvæ hatched from the eggs attacked the leaves, nor could it be seen what became of the larvæ. It may be remarked that "fat hen" is a common weed in farm-yards and upon the sides of mixens.

PEAR AND APPLE SCAB (*Fusicladium dendriticum*, *Fuckel*).

In some seasons pears and apples in orchards and gardens are pitted with small scars or scabs. These not only affect the appearance of the fruit, but tend to reduce its size and make it more or less unhealthy. The scabs vary in size. At first they are not larger than a pin's head; in some cases they become as large as a small pearl button. Upon examining them microscopically it will be seen that there are thick congeries of mycelial threads of a fungus running through the upper cells of the fruits. These threads are at first colourless, and as they mature they become reddish-brown. From these mycelial centres conidia are produced, oval and colourless at first, but becoming darker later on.

The hyphæ of the fungus pervade the tissues of the fruits near them, and new centres of disease are created by spores from the conidia.

This fungus, which is known as *Fusicladium dendriticum*, *Fuckel*, or *Cladosporium dendriticum*, *Wallroth*, belonging to the family *Hyphomycetes*, is found also upon the leaves of apple and pear trees, and in this form it causes unhealthiness to the whole system of the tree.

Pear trees have been considerably affected this year by the *Fusicladium dendriticum*, especially those trees of the variety known as Williams' Bon Chrétien.

To prevent this disorder it would be desirable to spray the trees with the Bordeaux mixture—bouillie bordelaise—composed of sulphate of copper and lime.

This mixture should be composed of from 12 to 15 lbs. of sulphate of copper, and 6 to 8 lbs. of lime, to 100 gallons of water.

The strength of the mixture must depend upon the state of the foliage. When the leaves are tender the weaker solution should be used. When they are older the strongest may be applied. But if the solution is applied as a remedy when the leaves are old and the fruit is formed, its strength may be increased even up to 20 lbs. of sulphate of copper and 10 lbs. of lime to 100 gallons of water.

Experiments upon this fungus with the Bordeaux mixture have been made in various parts of the United States with much success.

As a means of prevention the Bordeaux mixture should be applied soon after the leaves have been formed. The solution must not be too strong at this stage. A second dressing may be given after the blossom has set, and a third three weeks later.

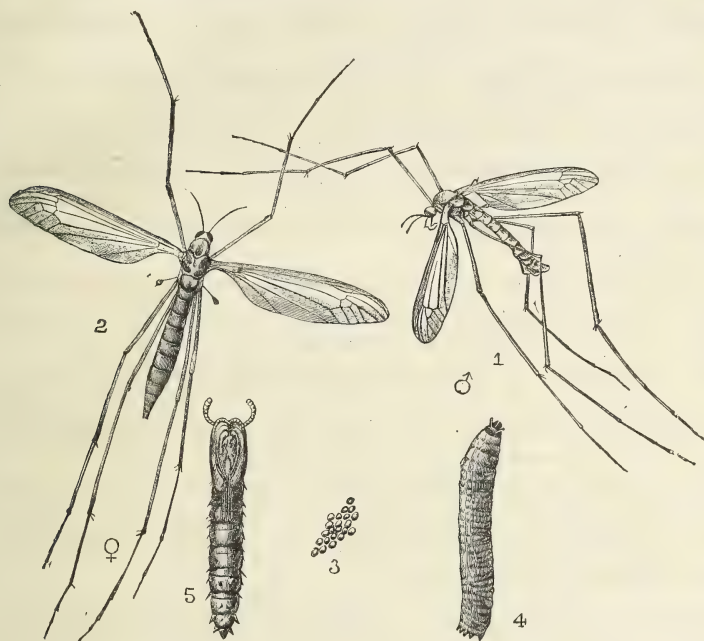
This treatment has been tried to a small extent in this country, but only as a remedy so far, and rather late in the season. But it appeared to check the progress of the fungus upon the young fruits.

THE DIAMOND BACK MOTH (*Plutella Cruciferarum*).

The first report of the appearance of the Diamond Back Moth this season was received by the Board of Agriculture on May 30th. There were a few reports of its appearance in English counties, but the injury it caused was very trifling. The weather was most propitious for the rapid growth of swedes and turnips, and not favourable to the development of the insect, which does not like heavy and frequent showers, as was clearly shown in 1891 when there was an alarming attack in the eastern parts of England and Scotland.

THE NUT MITE (*Phytoptus Avellance*).

On the 29th of May many of these mites were found in decaying buds of cob-nut trees that were widely opened. They were also seen in quantities upon the young leaves from neighbouring buds showing clearly that they get upon the leaves and derive nourishment from them. They were noticed, too, upon the young stems, among the hairs upon the cuticle. This seems to show that these mites pass their lives upon the nut trees.

THE DADDY LONGLEGS (*Tipula oleracea*).

1. Male.
2. Female.
3. Eggs.

4. Larva.
5. Pupa.

(All natural size, except the eggs, which are slightly magnified.)

The larvæ, or grubs, of the awkward, long-legged fly, familiarly known as "Daddy Longlegs," are frequently most destructive to various crops of the farm and garden. These grubs are called "leather jackets" in some counties, on account of the toughness of their skins. Being large and voracious they quickly clear off a crop. They attack indiscriminately all kinds of corn, grass, turnips, mangels, clover, peas, beans, and cabbages, and they are particularly fond of strawberry plants. But it is in pasture-land that they do most mischief, sometimes destroying whole tracts of grass-land in England, Scotland, and Ireland, as well as in some continental countries.

They not only ruin the crop of grass during the year of infestation, but often materially injure the roots of the grasses, especially those, like cocksfoot, which have succulent stems, so that they are completely destroyed.

Lawns and cricket grounds are frequently damaged by the "leather jackets." In 1884 Lord's Cricket Ground was seriously injured by their persistent attacks.

It is recorded in Kirby and Spence's "Introduction to Entomology" that in 1813 hundreds of acres of grass-land were

entirely destroyed by the grubs of "Daddy Longlegs," and in 1842, much harm was caused by these grubs in various parts of the country, notably to marsh pasture-land in Kent, by the banks of the Thames, in the Isle of Grain, and adjoining districts. A correspondent writes that in 1842 "the grass had been eaten so bare by the grubs that the dust was blowing on the marsh pasture-land in July." This extraordinary attack is remembered by the old shepherds, who were at their wits' ends to find food for their flocks. In the present year the marsh pasture-land in these same important grazing districts was very badly infested, so that there was hardly any keep in May, and much of the land was quite bare, and as brown as it had been in the previous dry summer.

It is curious that only the pasture, or regularly grazed land, was attacked, while the meadow-land almost entirely escaped infestation. The drier the grass-land the more severe was the attack; and wet, low-lying, and undrained grass-land was practically quite free from harm. It has been generally supposed that the flies like to deposit their eggs in damp, marshy places, where grass is coarse and luxuriant, but in the attack of the present year in Kent they must have laid their eggs upon grass-land that was dry, brown, and bare of herbage from the effects of the scorching summer of 1893, in preference to the more grassy and damper meadows.

As many as 200 of these "leather jackets" have been taken from a square foot of earth dug from grass-land. In the present year, 48 were taken from a square foot of pasture-land in the Isle of Grain.

Life History.

The "Daddy Longlegs" fly is a familiar insect. The male is smaller than the female. The body of the female, which has nine joints, and tapers at the end, is about an inch in length, with a wing-measurement of about two inches across. The thorax is ash-grey with brown stripes. The abdomen is tawny in hue, and the wings are grey or brownish-grey. There are six very long legs; the hinder-legs being longer than the others.

It has been observed that while laying eggs the female moves over the ground with her body in a vertical position, by the help of the hinder-legs—the two pairs of forelegs being in the air—and the end of the abdomen, which performs the office of another pair of legs. The eggs are placed by the ovipositor on the ground, or upon grass, weeds, or rubbish. Egg-laying takes place in the autumn. One female will lay as many as 300 eggs, according to Curtis. The eggs are of a conical shape, and in colour are shining-black. It is believed that the eggs are hatched in about 15 days. The larvæ lie in the earth during the winter, feeding upon the stems of grasses and corn near the surface while the weather is open, and going deeper into the earth when frost

comes. They have been found full-grown and feeding voraciously on the roots and stems of corn and grasses in January in mild weather.

The larva or grub is an inch long. It is somewhat variable in colour, but generally brownish, or brown shaded with dark green, or sometimes lighter and approaching ash-grey. Two light-coloured lines may be traced down the back.

It puts out at pleasure its black head, furnished with strong jaws for biting. At the tail end, which is cut square, there are several tubercles. Though it has no legs it moves about easily and quickly.

Pupation generally occurs towards September. The pupa is nearly as long as the larva, and of a similar colour. In changing, spines are formed at each segment, as shown in the figure, by means of which the pupa wriggles up through the earth and the fly escapes, leaving the chrysalis case sticking half out of the ground.

Prevention and Remedies.

Congenial habitations of the Daddy Longlegs flies are wet ditches, damp sides of hedgerows, and headlands, marshes, and low-lying and undrained meadows. These are their headquarters and breeding places, and obvious methods of checking their increase are to keep ditches well brushed and cleaned out, to abolish hedgerows, where possible, or to keep them trimmed, and to drain wet land.

Very often the attack of these flies is upon field crops following clover, or artificial grasses, whose herbage has induced the insects to deposit eggs, and has served as shelter for them. It is important, therefore, to keep clovers and grasses down close before the land is ploughed in the autumn. Folding sheep upon such land is a capital mode of prevention. Egg-laying commonly takes place in the early autumn, and it is therefore desirable to plough clover and other grass-leys early where there has been infestation, or where there is fear of infestation. Such land should be ploughed deeply and rolled to keep the herbage under, and the eggs deeply buried so that larvæ cannot be hatched from them. Meadows and pasture-land that have been infested should be kept well fed off throughout the latter part of August and during September. Wheat and oat-stubbles, where there has been an attack of these larvæ, should be deeply ploughed in the autumn.

Where strawberry-plants have been injured by the larvæ, the plants should be trimmed close, and the spaces between them hoed or dug, or horse-hoed where large breadths are cultivated, and soot and lime applied, or gas-lime when it can be obtained.

Cricket-grounds and lawns that have suffered from these insects should be frequently rolled and mowed with a machine during September and October.

If clover-leys, or other land for autumn sowing, are manured with farmyard manure, it is desirable that the mixens should be turned a short time before the manure is carted out, to cause heating, as stale mixens harbour weeds and the eggs of the Daddy Longlegs.

When an attack of the grub is noticed in grass-land a dressing of soot and lime, in the proportion of 1 part of lime to 3 parts of soot, should be put on. A mixture of one-and-a-half hundredweight of nitrate of soda and three hundredweight of common salt per acre has been proved to check the grubs, and at the same time stimulate the growth of the grass.

Mangels are also subject to the attack of these grubs. Frequent horse-hoeings have been found to disturb them, and dressings of nitrate of soda and salt in the proportions just given have been applied in such cases with success.

Where injury is feared from these grubs, owing to the appearance of unusual numbers of Daddy Longlegs in the autumn, it would be well to apply gas-lime to the land, or soot and lime; and in the case of pasture-land to harrow and roll it well.

Natural Enemies.

Rooks, starlings, peewits, and other birds, devour the grubs in a wholesale manner. Starlings are especially useful when they congregate after the breeding season. It has been noticed that meadows and marshes near rookeries have escaped injury while grass-lands at some distance from these sustained much harm.

LARCH DISEASE.

In the *Forstwissenschaftliches Centralblatt* reference is made to a method of extirpating larch canker, which is stated to have been tried with complete success in a forest at Markersbach. Branches covered with fructifications of *Peziza calycina*, as well as those attacked by canker, were cut off and burned. Diseased larches were completely removed wherever this was possible. So carefully was this work executed that, on a subsequent examination, no larches infested with canker could be found. The same treatment was applied in another locality, and again resulted in complete success.

THE TURNIP APHIS AND THE CABBAGE APHIS (*Aphis rapae* and *Aphis brassicae*).

These aphides are sometimes most injurious to cultivated plants of the Brassica group, and they have caused considerable harm this season in some districts, especially to swedes and turnips.

They suck the juices from the leaves, hindering the growth of the plants, while their peculiar excretion known as "honeydew," falls on the upper surface of the leaves, and chokes their pores.

The most common of these two species is *Aphis brassicae*. The winged female which brings forth living young is black as to the head and thorax, with a green or yellowish green abdomen, and dark yellow legs. The wingless females, known commonly as lice, are oval in shape, of a greenish colour with green antennæ, and are covered with mealy coats.

The other species is *Aphis rapæ*. The wingless female is greenish, and, in some cases, ochreous yellow. The winged female has a black head and thorax with yellow abdomen, yellowish legs and dark antennæ. This species is found upon a great number of plants besides those of the Brassica group.

In ordinary farm practice it is almost impossible for these aphides to be harboured in egg or larval form during the winter upon the crops they had injured in the summer, as these are either fed off by sheep or are topped and tailed, the tops being ploughed in at once. Cabbage plants put in during the autumn are of course excepted. It is quite possible that the aphides may pass the winter on these and on other plants of the cabbage tribe intended for seed. But without doubt the main attack of these aphides has come from weeds which have retained the eggs during the winter, have harboured wingless females near their stems and roots, and have furnished them with food in the earliest spring, and nourished them until the cultivated plants were ready for them. Charlock is a most dangerous source of attack from these aphides as it shelters them and furnishes early food for them, and charlock has been most abundant this year. Other cruciferous weeds also harbour them.

Washing, or syringing, infested plants with soft soap and quassia, in the proportion of 7 lbs. of soft soap and the extract of 7 lbs. of quassia chips, to 100 gallons of water, is a good remedy if it can be carried out. This may be put on by means of knapsack machines, or by garden engines set upon high wheels and furnished with long lengths of hose, or by a horse distributor which can be set so as to spray the under surface of the leaves.

Lady birds, *Coccinella*, clear off quantities of these aphides, and there are several species of flies which do good service. One is known as *Trionyx rapæ*, a very small hymenopterous insect, which puts an egg into the body of the aphis, and its product, a tiny maggot, feeds upon its vitals and destroys it.

WIREWORMS.

There was an unusual attack of wireworms in the spring throughout the country. Persons travelling by rail noticed bare patches in many wheat-fields, while young oats showed unmistakable signs of wireworms at their roots. Fortunately

the weather was so favourable for vegetation that the corn plants grew away from the attacks of the enemy.

In hop land wireworms did much mischief in very many districts. The bine checked suddenly and made short turns. It was thought this was due to the action of the Red Spider in the previous summer, which might have weakened the stocks, but close examination showed that wireworms were at work in the crowns of the hills. In some "Old Golding" plantations much weakness was caused, and in a few cases the bine has remained weak. Forcing weather in May and June, however, worked wonders, and prompt measures taken by the planters in the shape of traps of mangel wurzel, carrot, turnip, potatoes, and rape-cake put round the infested hills much mitigated the evil.

It has always been most difficult to suggest methods of prevention and remedies for the attacks of wireworms. Their horny coats resist insecticides and insectifuges, and their long lives and their power of burrowing deeply into the soil, make dealing with them effectively almost a hopeless task.

Valuable experiments against wireworm have been conducted in the last four years by Messrs. Comstock and Slingerland, of the Cornell University Agricultural Experiment Station at Ithaca, New York State, and the results show that it is almost impossible to extirpate them.

These experiments were of three kinds:—

1st. *Protection of seed.*—The most serious injuries are caused by wireworms to the seed, and to the plants just after germination. Seeds were "protected" by coatings of Paris green, tar, &c., by soaking in solutions of salt, chloride of lime, copperas, kerosene oil, turpentine, and strychnine. In no case were these coatings and soakings found to be of the least use in preventing the attack, or killing the wireworms.

2nd. *Destruction of wireworms by starvation.*—It has been often insisted that wireworms may be starved out by long fallowing land, or by cultivating only certain crops which are distasteful to the worms on infested land. After careful experiments in the direction of fallowing land, Messrs. Comstock and Slingerland "would not advise the farmer to lose the use of his "land for a season, and the labour necessary to keep it free from "all vegetation, in the hope that he may thus starve out the "wireworms."

As regards the sowing of crops distasteful to wireworms, and thus starving them out, buckwheat, mustard, rape—said to be their special aversion—were tried without any satisfactory results whatever.

3rd. *Destruction of wireworms by insecticides.*—Kerosene oil solution, made of one part of oil to 20 parts of water, was sprayed on soil in a cage containing 25 wireworms. The solution was made to penetrate the soil by frequent sprayings.

Although the final results showed that this was effective to some extent when made to thoroughly permeate the soil, the

cost would be very great, as 1,000 gallons of oil would be required to spray one acre, and it would be necessary to drive the solution into the soil by frequent and copious sprayings. Petroleum was tried with less effect than kerosene. Poisoned and sweetened dough was placed in the cages, but the wireworms were not attracted by it.

Bisulphide of carbon, as used against the phylloxera, killed wireworms, but it would require 1,000 lbs. of the liquid to treat an acre, so that it would only be practicable and profitable to employ this on limited areas and for valuable crops.

It was shown by experiments with salt, that to destroy wireworms salt must be used at the rate of about eight tons per acre, which would be practically destructive to vegetation. The same deductions were made from the use of kainit and muriate of potash. Lime at the rate of 200 bushels per acre and gas lime at 20,000 lbs. per acre were tried with the same results.

The experiments described were carried on for three years with the greatest care and the strictest attention to details. Specially constructed cages were used with plates of glass let into the sides for observation. Though the conclusions arrived at do not convey much hope of cultivators being able to kill or starve wireworms, there seems to be some reasons for thinking that the application of salt, kainit, lime, and kerosene, with other offensive substances in moderate quantities, may keep the pests at bay and away from young plants, at least until their roots are established, and they can grow away from the attack.

Various "traps" were tried at Cornell Station, but without very conclusive results. It has been proved, however, in the United Kingdom that wireworms can be trapped, as, for instance, in hop plantations, by pieces of mangel, potato, carrot, or turnip, and especially by rape-cake placed round the hills. The traps should be examined twice a week.

Rape-cake crushed in small pieces, sown broadcast upon oats, wheat, and other crops at the rate of five to seven cwt per acre, will frequently be the means of saving the crop infested with wireworms, as the insects prefer the rape-cake and feed upon it while the plants grow away from their attacks.

THE TURNIP "FLY OR FLEA" (*Phyllotreta nemorum*).

This insect has been very troublesome this season, especially in districts of Yorkshire. It is in reality neither a fly nor a flea, but a beetle provided with wings for flight, and having powers of jumping long distances when disturbed. Curtis says that it can jump eighteen inches. In some seasons it clears off young plants of swedes, turnips, rape, cabbage, kale, and others of the genus *Brassica* as fast as they come up. For example, in 1881 its ravages in England and Scotland were disastrous.

Thousands of acres were sown three times, and the plants were cleared off as fast as they appeared. If dry weather sets in soon after turnips have been sown, it often happens that the "flea" clears them off as fast as they come up, but when showers follow the sowing, the plants grow away generally from the attacks of this insect.

The turnip-beetle is only about one and a quarter lines in length. It is black, with a yellow band on each wing-case. Its wings are very long, and expand more than a quarter of an inch, enabling the insect to take long flights to congenial food. During the winter the insect remains in beetle-form under clods, tufts of grass, and weeds, on the outskirts of woods and by the sides of fields, hedges, and ditches. When spring arrives, it is sustained upon wild cruciferous plants, such as the wild-radish, hedge-mustard, and particularly charlock. As soon as the turnips are up, the beetle begins to feed upon them, and lays eggs on the under sides of their leaves. In about ten days little yellow larvæ come from the eggs and burrow into the leaves; after living upon them for about six days they fall to the ground and assume the pupal state, in which they continue for about 11 days, and then change to beetles, which again attack the turnip-plants. Several generations are evolved during the summer in favourable circumstances.

Prevention.

Sowing turnip-seed upon a "stale furrow" tends to prevent the attacks of the beetle, or to diminish their severity, because a "stale furrow" implies what is known as a "good season," or a fine tilth, in which the plants grow quickly, whereas land freshly ploughed up does not, as a rule, work down well, but is cloddy. Moisture evaporates much more quickly in cloddy ground, and beetles object to moisture, which also makes the plants grow quickly out of their way.

Turnip-land should be rolled down immediately after the drill; as this operation levels the ground and keeps in the moisture, thus enabling the plants to come away rapidly.

Most farmers drill manure with ashes, or mould, with the seed, so that it may be close to the young plant and help it along. The ashes and mould should not be too dry.

It is most important to sow plenty of seed, and to take care that it is of good germinating power.

Cruciferous-weeds, such as charlock, must be kept down as much as possible. It has been noticed that the beetles are more plentiful in places where charlock has been abundant in crops.

Remedies.

Dressings of soot are frequently very useful when the beetles are thick upon the turnip-plants. Lime and soot, mixed in the

proportion of two bushels of lime to one of soot, form a valuable dressing. Wood-ashes, and ashes from burnt earth and peat moss, well powdered, to which from two to four quarts of paraffin oil have been added to each cwt., have been used with some advantage. All these dry dressings should be applied when dew is on the plants, or after rain.

Rolling the land is very often serviceable, as it disturbs the beetles and presses soil round the plants and keeps the moisture in.

A light wide framework of freshly tarred boards set upon wheels and drawn over the plants, so that the boards are just above the foliage, is a useful appliance for catching beetles, which instinctively jump as the boards pass over them and alight on the tar. Many acres can be treated in a day with a machine of this kind. The tar must be renewed from time to time.

Driving flocks of sheep over plants infested with beetles has been found advantageous. This must be done in dry weather and very early in the morning that the dust may stick on the leaves.

Dry substances may be put on with a horse-distributor, and liquid mixtures, such as soft soap and quassia (6 lbs. of the former with the extract of 8 lbs. of the latter to 100 gallons of water), and pure carbolic acid or paraffin oil may be distributed with the same machine.

SURFACE CATERPILLARS.

In some parts of Germany much damage has recently been done to crops by surface caterpillars, the larvæ of the Dart Moth, *Agrotis segetum*.

The subject has engaged the attention of the Minister of Agriculture, who, according to the *Deutsche Landwirtschaftliche Presse*, has consulted certain agricultural societies with a view to extirpate the pest.

The best means of destruction seems to be to pick up the caterpillars behind the plough. This can readily be done by women and children either in spring or autumn. It has also been found that fowls are very useful in this respect. The moth itself can easily be caught in the following manner:—In the evening at the time of flight, barrels with chinks in their sides are set down in places frequented by the moths. A lamp is placed on the bottom of each barrel, which is smeared with tar on the inner surface. The light attracts the dart moth and other insects into the barrel where they are caught by the tar.

This method is said to have the advantage of being cheap and easily practicable everywhere; moreover, it results in the capture of thousands of injurious insects.

A NEW DISEASE OF THE POTATO.

In the *Zeitschrift für Pflanzenkrankheiten* a new disease of the potato is described by Dr. Sorauer, which he says may be called the "black dry rot of the potato."

Dr. Sorauer says the affected tubers are large and exhibit here and there a tendency to the formation of tubercles. The cylindrical-shaped specimens are unusually light, and on tapping the tubers it is easily ascertained that they are either hollow inside or of an abnormally spongy consistency. Every specimen exhibits externally traces of the dry rot, which almost always enters the tubers from the root end. There are also here and there in many tubers isolated patches of rot, whereas the ordinary dry rot proceeding from the root or stalk end, and also perceptible on the fibrous remains of the stalk, spreads in connected patches.

But the difference between this new disease and the true "dry rot" is the circumstance that when the tubers are cut in half, the healthy portion of the flesh, which is perfectly white at the moment of cutting through the tuber, turns in 10 or 15 minutes, either in parts or over the whole of the cut surface, to a rusty red colour. The rust-red surface changes later to black. Individual tubers are filled inside with a black sappy mass so that only the outer portions have maintained their normal white condition and hardness.

The cut surface of the black mass gets lighter in colour in drying, it also contracts and becomes spongy and tinder-like, while the outer portions which have remained hard are at first of a glistening white and change later to a normal chalky white.

Between the latter and the inner spongy mass there are thick layers of fungus of a whitish-grey colour, and between these the dark scabby patches formed by the mycelium of *Rhizoctonia Solani*.

The black, spongy, inner mass is generally entirely interpenetrated by a vigorous mycelium, which develops into dense layers of white filaments in the holes gradually formed by the contraction of the diseased flesh of the potato, and absorbs a little of the brown colouring matter of this diseased flesh. Here and there crystals are deposited which are not oxalate of lime, but are apparently phosphate of lime. These crystals, which are also secreted in the process of decomposition of other reserve matter cells, point to putrid changes, as do likewise the unusually large anguillidæ to be found in the holes in the flesh, and the myriads of bacteria infesting the entire tissue.

In connection with this disease the result of an examination with the Trommer probe is especially worthy of attention. By this it is shown that the above-mentioned zone of transition, lying between the black internal flesh infested with mycelium and the healthy exterior zone, is very rich in glucose or similar

reducing substances, whilst the two portions of tissue touching it on either side contain no trace of glucose. The mycelium is, moreover, in no respect the cause of the brown colour, for isolated brown patches of tissue are found in the zone of transition, and these are free from mycelium but already contain bacteria. The latter might, therefore, be regarded as agents of infection. Whether they produce the blackness of the tissue is for the present not yet determined, but it seems to be certain that these dark brown changes precede the invasion of the mycelium, and also that at one point they take their rise from without. For if these apparently isolated dark brown patches which appear in the healthy flesh are cut up into separate layers a region is always found in which the patch extends in a smaller zone towards the exterior. The mycelium also spreads in the same direction. Such spots are not visible from the exterior to the naked eye.

Whether the mycelium inside the tuber belongs to one or more fungi must be determined later by precise cultural experiments. The observations hitherto made have shown in parts, in unusual luxuriance, the colourless ramified growths of conidiphores which correspond to the "*Spicaria Solani*."

On the other hand, as in the case of ordinary "dry rot," mycelium also sprang from the interior towards the exterior in the form of hemispherical, verrucose, white (becoming darker later), hard bundles, distributed in zones. The zone formation in these bundles was produced by spongy layers formed partly of parallel bundles of hyphæ, alternating with dense pseudoparenchymatous layers. In cultivation in a damp environment micro- and macro-conidia of *Hypomyces Solani* are found later at these parts, which, as is known, are also very frequently found in the ordinary "dry rot." A further remarkable difference in the present case is, however, a still greater irritability of the lenticels, between the elongated cells of which lie numerous colonies of bacteria, which after being a few days in water change into yellowish, thick, slimy layers, consisting of sprouting long and short rods, together with spiral forms and a few cocci. On keeping the diseased tubers in a room, the disease is seen to be inactive, while suberous cells are formed in the zone of transition, and here only is there a disappearance of starch, which is still to be found in abundance in the healthy, and partly also in the older browned flesh.

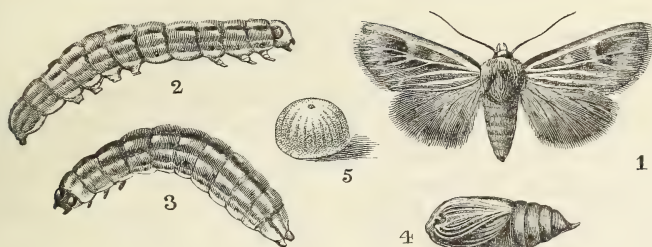
From the foregoing observations, it is only possible to throw out conjectures as to the cause of the disease. It may be a case in which the tubers (possibly through defective or excessive manuring) have developed a ferment which gives rise to a decomposition of the contents of the cells, and to the production of matter related perhaps to the humus or ulmic substances. This matter changes, quicker and more intensely in the light than in the dark, into the brown substance which first gives the flesh on the cut surface a rust-red, and later a black appearance.

This, owing to the characteristic decomposing processes caused by the temporary formation of sugar or similar reducing substances, prepares the medium for the bacteria and mycelia, already penetrating from the exterior. More detailed information as to the conditions of cultivation under which the tubers were produced cannot be obtained. The disease, moreover, resembles in many respects the various morbid appearances which are found simultaneously in the sugar beet, and which have been for the present collectively included under the name of "bacterial gummosis."

THE ANTLER MOTH (*Charceas graminis*).

The caterpillars of this moth occasionally do much harm to pastures, meadows, and sheep-runs in this country. Their injury has been principally confined to sheep-runs in mountainous districts. In 1881 there was a somewhat serious attack near Clitheroe and the district round Pendle Hill, as described by the editors of the *Entomologists' Monthly Magazine*. It is stated that these caterpillars travelled together in thousands, and devastated the land over which they passed to an alarming extent. Much harm was done by them in 1884 to hill pastures in Glamorganshire, upon an area of about 10 miles, near Bridgend. Upon the continent of Europe these caterpillars frequently destroy corn as well as grass plants.

The moth is called "Antler" on account of the markings on its fore-wings resembling the branches of antlers. Its fore-wings are brownish with white streaks. The hind-wings are grey or brownish grey with pale fringes. The female lays from 200 to 300 eggs in the autumn. Many entomologists state that eggs are hatched in about three weeks, and the larvæ from these hibernate among the roots of plants. Buckler, however, who was a careful observer, and is corroborated by Staunton, says "the straw-coloured eggs are laid in the autumn and undergo one or two changes of colour, the last change not long before the larvæ are hatched, some time in spring; the exact date varying according to the character of the season. They feed on grass, showing no decided preference beyond that of choosing the smooth and hard grasses rather than hairy and woolly species; they feed up in summer, retire underground, and make neat oval chambers for their retreat during pupation, and the moths appear at the latter end of summer or the beginning of autumn." Mr. Buckler adds that through the kindness of correspondents he had been supplied with eggs of this species, and had reared the larvæ from them to full growth.



THE ANTLER MOTH.

In the above illustration the moth (Fig. 1), larvæ (Figs. 2 and 3), and pupa (Fig. 4), are represented in their natural size, while the egg (Fig. 5) is greatly magnified.

When fully grown the larva is about $1\frac{3}{8}$ inch long, with bulk in proportion to its length.

The head is brown, and the rest of the body is more or less of a brown colour, interspersed with deeper brown shades. There is a dark coloured plate on the second segment and another on the oval segment. The stripes running down the back are lighter brown, and there is also a light-coloured line between the spiracles, and the under part of the larva is lighter than the upper part of its body.

The pupal state lasts about three weeks; the pupa is blackish brown.

There appears to be no effectual means of checking the progress of these caterpillars but to fire the herbage in front of them, or to make fires if there is not sufficient herbage to give good flame and heat.

In an attack in Thuringia large ditches were dug and cattle turned into them to trample on the larvæ and pupæ.

Like many other caterpillars they are, as Koller points out, affected by heavy and continuous rain.

XIII.—GENERAL AGRICULTURAL NOTES.

WHEAT GROWING IN QUEENSLAND.

The Board of Agriculture have recently received from the Under Secretary for Agriculture, Queensland, a copy of his Report for 1892-93, which contains some observations by Mr. E. M. Shelton on the prospects of wheat growing in that Colony.

Mr. Shelton observes that the progress of general farming in the Colony has from the first been timid and hesitating. The early settlers and their successors have been for the most part men possessed of small means, and deficient knowledge and experience of agriculture. Old-world agriculturists found in the strange conditions of soil and climate prevailing in Queensland obstacles which previous knowledge did not help much to overcome. Under such unusual circumstances every cultivator became perforce an experimenter, but the result of his endeavours has been chiefly a harvest of facts, often conflicting and inconclusive. Moreover, agriculture has been, and is now to some extent, looked upon as an avocation to be taken up only as leisure from other callings permitted. The occupations which have attracted men and capital to the colony have for the most part been squatting, mining, and the various commercial enterprises connected therewith. So long as the best of pastoral lands could be bought outright for a few shillings per acre, and bullocks found a ready sale at 8*l.* per head, while wool brought 1*s.* 2*d.* per lb., there was small temptation to the more arduous and less certain business of arable farming. Agriculture in Queensland may be said to have always been a last resort, to have always waited on some other calling.

Wheat culture has shared the general fate of agriculture in the Colony. It has been repeatedly taken up, chiefly in the Darling Downs region, and as often abandoned, and the fields allowed to revert to the original grass crop. The absence of machinery for harvesting, the want of mills for grinding, to say nothing of the lack of knowledge of varieties and methods of culture suited to the Colony, sufficiently account for what otherwise seem unaccountable fluctuations in the wheat record.

As far back as 1867 the statistics of the Colony show a wheat area of 2,657 acres. In 1870 the total yield for the year amounted to 39,787 bushels, and this was increased to 81,161 bushels in 1873, while in 1891 the yield was 392,309 bushels—the largest in the history of the Colony. On the other hand, in 1886 only 21,221 bushels were reaped in the entire Colony, while in 1888 there were cut for grain only 499 acres, which gave a yield of 8,265 bushels of grain. These fluctuations in the wheat yield

can be counted little less than remarkable. Taken by themselves they seem to indicate that wheat-raising is at times liable to an extraordinary fatality. In actual fact, the peculiar circumstances of the Colony, as much certainly as seasonal variations, furnish the explanation of the anomalies of the annual wheat returns.

For years past the mines, the northern plantations, and the rapidly growing towns of the Colony, to say nothing of railways and other public works in progress, created a demand for hay, maize, and provender generally, that Queensland farmers have only very recently been able to supply. Mr. Shelton says that it may be said in strict truth that, outside of the sugar plantations and the small fruit-growing districts along the coast, the great end of Queensland farming has been the production of horse-feed. In a country ranking with the first in the abundance, cheapness, and excellent quality of its natural herbage, hay in all its forms has found the best market in the world. The effect of all this upon the wheat crop has been precisely what might be expected, and what the statistics show. On the first appearance of rustiness in the crop, or on the slightest provocation in the shape of threatened drought, the mower was put at work and the wheat crop was sent to market as hay. In any event the crop was worth nearly or quite as much in the condition of hay as it would fetch when allowed to ripen into grain, and there were fewer risks in the hay crop, and less labour and simpler machinery were required to harvest it. The temptation thus to convert the wheat crop into horse provender was irresistible, and the farmer who succumbed to it had the soundest of business reasons for the course he took.

It is only in the light of these facts that the history of the wheat crop in Queensland can be intelligibly read. Fortunately for the branch of agriculture under consideration, old things have passed away never to return. The harvest of the wheat fields of the future will, it is said, be wheat, not chaff, for the best of reasons—that the wheat crop is profitable, while the hay crop is not. Farmers have come to know the capabilities of their soils, and by observation during bad and good years they have accumulated a stock of experimental knowledge of varieties, times of seeding, and methods of cultivation that are certain to stand them in good stead in the years to come.

NICOTINE FOR SHEEP-SCAB.

The *South American Journal* states that a new industry is being opened up in France in the manufacture of an essence of nicotine for sale to sheep farmers in South America. As is well

known, the French Government has a monopoly in the manufacture of tobacco, from which it extracts the nicotine before delivering the "weed" to the consumer. This nicotine, in the form of a juice, was not sufficiently pure to allow of its being used for industrial purposes, but the Government is reported to have now found a means of obtaining an essence of nicotine by concentration of the juice. This can be used not only by agriculturists as an insecticide, but it is apparently very efficacious for the treatment of sheep suffering from scab, and as this disease is prevalent in Argentina and Uruguay, the French Government hopes to supply large quantities of nicotine to South American sheep farmers. It appears that an agent has already been appointed for the sale of the liquid in Argentina.

WOODLANDS IN SUSSEX.

The *Timber Trades' Journal* has recently published an interesting article on the woodlands in Sussex.

Plantations in Sussex are formed, it appears, almost invariably for the growth of underwood, and seldom for that of timber. Oak, being indigenous to the soil, freely reproduces itself from self-sown acorns. Care in preserving the tillers as they come up, and their proper thinning as they increase in growth, would seem to be nearly all that is necessary to ensure a crop of timber.

The woodlands may be divided into three classes: 1st, land wholly under timber; 2nd, lands partly under timber and partly underwood; and 3rdly, plantations wholly underwood, the second class forming the principal portion. The underwood on these lands being formerly composed almost entirely of hazel, has of late years been much improved by filling up the bare and vacant spaces with ash, birch, or Spanish chestnut. Plantations that are of comparatively recent date are formed, in some cases, altogether of Spanish chestnut, where the soil is found suitable to its growth, or of a mixture of ash, birch, and chestnut; willow and alder are also planted in damp or boggy situations.

The underwood is sold chiefly by auction, the sales taking place from the middle of October to the end of November in each year, in lots of about two to six acres, although frequently larger and smaller lots may be put up, depending on the size of the plantation or the quality of the wood, the price being generally at so much per statute acre, but sometimes by the piece. The age at which the underwood is cut varies from eight to twelve years' growth, plantations being cut at an earlier age than underwood grown beneath timber. It is stated that good planted stuff realises from 2*l.* to 4*l.* per acre per year's growth, 30*l.* to 35*l.* per acre being generally the highest price, average planted stuff of eight or nine years' growth selling at from 16*l.* to 25*l.* per acre.

CONSUMPTION OF MARGARINE IN DENMARK.

According to the *Ugeskrift for Landmaend* there were in Denmark, on the 31st March 1893, 19 margarine factories, as compared with 16 in the previous year, and 14 in 1891. The total amount of margarine produced in the kingdom in the year ended March 31st 1893 is estimated to have been 17,944,000 lbs. avoird., as against 14,185,000 lbs. in 1891-92 and 11,299,000 lbs. in the preceding year. The imports of margarine in the same periods were 2,200,000 lbs. in 1892-93 ; 2,200,000 lbs. in 1891-92 ; and 2,090,000 lbs. in 1890-91.

The export of the article was practically nil, so that all the margarine produced or imported must have been destined for home consumption. In 1888 the home consumption of margarine in Denmark was about 4,400,000 lbs.; in 1889 it reached 11,000,000 lbs.; while in 1892-93 it is estimated to have been about 19,800,000 lbs. This steady increase in the consumption of margarine is expected to continue until there is some improvement in the rates of wages and profits in agriculture and other industries. The price of margarine is said to have varied very much during the past year owing to the great fluctuations in the prices of oleomargarine.

BONANZA WHEAT FARMS IN CALIFORNIA AND DAKOTA.

In the Report of the Sub-Committee of the United States Senate, appointed in 1893 to inquire into the condition of agriculture, there is a description of some of the "bonanza" wheat farms of California and North Dakota.

The "bonanza" wheat farms of California are said to be larger than those of North Dakota, and it is not uncommon to find one man in this State exercising rights of ownership over a tract of 50,000 acres of land, and from that up to 100,000. The Sub-Committee heard of one case where two men claim to own 200,000 acres, and most of this is wheat land. The President of the State Agricultural Society, in describing the methods of raising wheat on the large farms of California, says that all the summer ploughing (more properly speaking, spring ploughing) is done with gang-ploughs. As large farming is done with these gangs, which consist generally of eight ploughs attached together, or eight ploughs in one frame, one man with a team of six or eight horses can plough six acres per day. In sowing the ground, the common broadcast seeder is employed, followed by an 8-horse harrow. Under this system 20 acres per day can be sown in good order.

In harvesting the crops combined harvesters are used, which cut from 28 to 30 acres per day. A harvester with an 18-foot cut of sickle will, in an average grain field, cut and thresh from 350 to 400 sacks, or 800 to 900 bushels per day, at a cost,

counting wear and tear of machinery, feed of animals, wages and board of men, not to exceed a dollar per acre.

The "bonanza" method of farming in California is said to have reduced the cost of cultivating an acre of wheat to half what it cost under the old system, and the cost of producing a bushel of wheat has been correspondingly reduced.

The wheat-harvest extends, usually, over a period of 60 to 90 days. It is rare that rain falls on the wheatfields between May and September. The straw is short and stands erect, curing in the warm sunshine, and the heads bend over gracefully, holding the grain in place firmly to the end of the season. During so long a harvest one machine can cut over an immense area, and a modern Californian harvester is a ponderous machine. It is drawn by a team consisting (according to size and capacity of the machine) of 16 to 30 horses, and cuts, threshes, and sacks the grain at the rate of about an acre per horse per diem. The horses are worked eight abreast in the first two or three ranks, with four or two leaders. A 26-horse team has three ranks of eight horses each, with two horses in front, and a 28-horse team has four horses leading. One man drives the team, one looks after the machine, while a third sews the sacks as they are filled. Thus three men dispose of 25 to 30 acres—often much more—of wheat in one day. Men with two or four horse waggons follow the machines at proper intervals of distance and gather up the sacks and haul them to the owner's warehouses on the railroad. These large farms extend many miles along the roads.

On a farm of 20,000 acres at Casselton, in North Dakota, 400 men are employed in harvesting and 500 to 600 in threshing. Two hundred and fifty pairs of horses or mules are used, 200 gang ploughs, 115 self-binding reapers, and 20 steam threshers. About the 1st of August the harvester is heard throughout the length and breadth of the land. Each machine is drawn by three mules or horses, and with each gang there is a superintendent, who rides along on horseback, and directs the operations of the drivers. There are also mounted repairers, who carry with them the tools for repairing any break or disarrangement of the machinery. When a machine fails to work, one of the repairers is instantly beside it, and, dismounting, remedies the defect in a trice, unless it proves to be serious. Thus the reaping goes on with the utmost order and the best effect. Travelling in line together, these 115 reaping machines would cut a swath one-fifth of a mile in width, and lay low 20 miles of grain in a swath of that great size in the course of a single day.

In 1889, California produced over 40,000,000 bushels of wheat, of which at least 30,000,000 bushels were exported. This amount, added to Dakota's surplus, gives a total of 60,000,000 bushels of surplus wheat.

WHEAT GROWING AT SANTA FÉ.

In a recent number of the *South American Journal* it is stated that the Santa Fé wheat farmers had not been deterred by the low prices of grain for the current year from ploughing up more land and sowing more wheat than ever. The colonists appear to have come to the conclusion that they can compete against the world. Wheat growing in the distant districts of the Province of Buenos Ayres, however, is stated to have been abandoned by many farmers, who prefer going in for alfalfa wheat not paying them at such a distance at present prices.

LAND TENURE IN NEW ZEALAND.

In the latest issue of the *Victorian Year Book* it is stated that in New Zealand the price of land varies from 5s. to about 40s. per acre. The distinguishing features of the land laws at present are, that blocks of land are declared open for selection, either before or after survey on the "optional system," which means that the selector can take up a section not exceeding 640 acres of first-class land, or 2,000 acres of second-class land, on cash payment, on occupation lease with right of purchase within 25 years, at a rent of 5 per cent., or on lease in perpetuity at a rental of 4 per cent. on the upset cash price. The freehold of lease, with right of purchase, may be obtained at any time after 10 years (if not within a gold-field) so soon as the conditions of cultivation have been complied with. Nearly all Crown lands are dealt with under this system now. Residence is compulsory, except under the cash system. Pastoral runs are let by auction for periods, depending on locality, from 3 years to 21 years. Carrying capacity is usually limited to 20,000 sheep, and the rent varies from 4*d.* to 2*s.* 6*d.* per acre, or about 10*d.* per sheep per annum. Small grazing runs are open for application in areas up to 20,000 acres at about 2½ per cent. rent on cash prices, usually about 10*s.* to 20*s.* per acre for terms of 21 years, with right of renewal for other 21 years at valuation.

Village homestead special settlements in New Zealand embrace land which may be disposed of on the "optional system," or may be sold for cash, the sizes of sections not to exceed 50 acres. Special settlements by associations of persons, not exceeding 11,000 acres in areas of 200 acres, are let on lease in perpetuity at 4 per cent. on the capital value. This system has been in operation over a period of six years; and on the 31st March, 1893, there were 85 settlements, accommodating 900 settlers with their families on 22,677 acres, and having improvements on the land valued at 61,700*l.* If the sum lent by Government were deducted from this valuation there remains the sum of 37,074*l.*, which represents the value of improvements made by the settlers, over and above those done with the amounts advanced by the Government.

PREVENTION OF THE SWELLING OF CHEESE.

A paper in the *Landwirthschaftliche Jahrbücher*, Schweiz, by E. von Freudenreich, deals with the swelling and cracking of cheese in the process of ripening: a difficulty often experienced by cheese-makers. This swelling is said to be due to the presence of large quantities of gas in the cheese, and Freudenreich is of opinion that the production of this gas is connected with the action of certain bacteria. His investigations into the matter have shown that the mischief may be largely prevented by the use of salt. Little swelling was found to occur in cheese to which 3 per cent. of salt had been added, while cheese made from the same milk without the addition of salt was full of cracks and holes. The treatment consisted in first heating the curd, then dipping off about two-thirds of the whey, and treating the remainder with three per cent. of salt. Freudenreich does not claim that salt is an absolute remedy, but he suggests that the treatment should be more widely tested by cheese-makers.

EXPORTS OF NORWEGIAN BUTTER.

According to a report recently made by the Dairy Inspector of the Agricultural Department of Norway, the exports of Norwegian butter in 1893 amounted to 13,063 cwts., but the quantity of butter imported into Norway in the same period was 16,336 cwts. In the previous year the imports of butter into Norway are stated to have been nearly 25,000 cwts., while the export of butter made in Norway amounted to 9,762 cwts.

It is stated in the report that there is still room for much improvement in the quality of the butter made in Norwegian dairies. The fodder employed on most farms is either insufficient to produce a satisfactory yield of good milk, or it consists largely of inferior materials. Too small a quantity of artificial feeding stuffs, especially oil-cake, is often used in winter, and, apart from the decreased flow of milk caused by this system of feeding, the milk itself yields a deficient quantity of butter, poor in fat. Even worse results are said to arise from a one-sided system of feeding with such fodders as brewers' grains, turnips, fish-cake and fish-meal. It is pointed out that these materials can be used with advantage only in small quantities mixed with large proportions of recognised good artificial foods.

THE FROZEN MUTTON TRADE OF NEW SOUTH WALES.

In the Annual Report of the Stock and Brands Branch of the Department of Mines and Agriculture of New South Wales, Mr. Wood, the Under Secretary of the Department, publishes a short review of the condition of the frozen mutton trade.

The number of sheep in the Colony at the end of 1893 showed a decrease of 1,099,426, due to the numbers boiled down, and exported, and to bad seasons in some districts. The Under Secretary states that it is satisfactory to find that the question of exporting frozen mutton is beginning to attract the attention due to so important a subject, and if the project which has been started to form a "Graziers' Meat Export Company" should result in success, it may fairly be hoped that a large increase upon the present export of frozen mutton will follow. There is, it appears, ample room for considerable expansion, as the acting chief inspector estimates the cast of fat sheep for the ensuing season at 5,708,466, whereas, so far as could be ascertained, the export of frozen meat last year was only 486,709 sheep, 47,241 haunches of mutton, and 4,670 quarters of beef. Of course, a quantity of tinned meat was exported, but the whole of the meat exports is said to bear no comparison to what it should be, considering the immense capabilities of the Colony and the practically unlimited market in Great Britain and the Continent. Representatives of some of the large firms in England, who have recently visited the colonies with the object of taking stock of their resources, have assured the Department of Mines and Agriculture that in various parts of Great Britain there are immense markets which have not yet been tapped. It is also observed that the opening of the Manchester Ship Canal will bring within reach an immense population of well-paid artisans, who may be reasonably expected to become large consumers of Australian mutton.

The success which has attended the introduction of the mutton trade in New Zealand is stated to have had much to do with the present desire in New South Wales to enter vigorously into an enterprise which promises to become, in the near future, one of the most important branches of industry in the Colony. The Under Secretary says that it has been urged, and no doubt with truth, that the proximity of the shipping ports to the pastures of New Zealand gives that Colony a great advantage over New South Wales, and that consequently the success achieved in the former Colony is no proof that the trade will be a success in the latter. On the other hand, however, it is stated that in America, where the trade is successfully conducted, meat is carried by rail 1,000 or even 1,400 miles to the port of shipment, and though the sea voyage from America to Great Britain is much shorter than from New South Wales, the distances by rail are so much greater that possibly it may be found that the conditions in New South Wales will enable her to compete successfully with both those countries. It is thought

that the success of New South Wales will probably depend, in a large measure, upon the solution of the problem, how to kill the sheep on or near their pastures, and to bring them in the best condition, and at the smallest cost, to the port of shipment.

As regards the wool clip for last year, it is stated that the estimate shows an increase of 18,160,914 lbs. over the clip of the previous year.

In the same report attention is directed to the very satisfactory prices realised in London for rabbits recently sent there from the Colonies, and it is suggested that by the aid of rabbit-proof netting, an inexpensive mode of trapping on a large scale, might be introduced, which, if supplemented by the best methods of preparing for export, might enable the Colony to secure a large and profitable trade which would prove a boon to pastoralists and farmers, and give employment to a very large number of men.

REPEATED CULTIVATION OF DEEP-ROOTED CROPS.

Dr. Schreiner, of Oberstankau, writing in the *Deutsche Landwirtschaftliche Presse*, says that agriculturists are right in using clover and other leguminous crops for the purpose of restoring in the cheapest form as much nitrogen as possible to soil deficient in that constituent. But he points out that this practice may be, and frequently is, carried too far. Not only are those nitrogenous crops often grown in fallows, but also in corn and stubble, to be ploughed in either in the late autumn or in the following spring.

Against such undue repetition of the sowing of deep-rooted crops, Dr. Schreiner strongly urges two objections. The first is with reference to heavy soils. Their heaviness renders it of essential importance that they should be thoroughly loosened and exposed to the air. But the above method of rotation seriously retards that process by causing delay in clearing away the stubble.

A second objection, which applies to light as well as to heavy soils, Dr. Schreiner puts in the form of a question. He asks whether land cultivated in the rotation referred to does not after a time become, as in clover-sickness, incapable of producing to perfection the other deep-rooted crops, as it certainly ought to do if the method is to attain its object. Clover-sickness, he observes, is a ghost which cannot be laid in many districts where there is forced cultivation of red clover. Its cause is generally supposed to lie in the fact that the subsoil has become impoverished in the mineral nutriment so essential to red clover. For the same reasons Dr. Schreiner thinks it highly probable that similar impoverishment may also ensue from excessive repetition of any deep-rooted crops, because they require similar chemical constituents in the subsoil. Besides, he adds, inasmuch as agriculturists

refrain from sowing red clover on moderate soil more than once in seven to ten years in order that the soil may in the meantime accumulate a sufficiency of those mineral elements necessary to the proper growth of that crop, it is questionable whether this object is attained where deep-rooted plants, which derive their sustenance from those same mineral elements, are sown repeatedly year after year.

AGRICULTURAL STATISTICS OF URUGUAY.

The volume of Agricultural Statistics for 1893 of the Republic of Uruguay contains some interesting details on the agriculture of that State.

The wealth of Uruguay is derived principally from two sources, viz., stock-breeding and agriculture. A great increase has lately occurred in the production of wheat. In spite of abnormally dry seasons the production of that cereal rose from 2,718,485 bushels in 1891 to 3,190,095 bushels in 1892 and 5,526,505 bushels in 1893.

Agriculture in 1893 occupied the attention of 10,764 native-born subjects (Orientals and Uruguayans) and 11,374 foreigners. These numbers comprise 11,606 freeholders and 10,532 leaseholders, making a total of 22,138 independent landowners. Including the labourers employed on farms, the total number of persons engaged in agriculture appears to have been 45,064 out of a population of about 720,000.

The number of ploughs in the Republic was 30,638, drawn by 117,799 draught-oxen. The number of acres sown with cereals in 1893 was 860,000, of which 512,000 acres were devoted to wheat and 340,000 acres to maize. The number of head of cattle in the Republic in 1892 was estimated at eight to nine millions, and the sheep at twenty-three to twenty-four millions.

CONSUMPTION OF MARGARINE IN NORWAY.

In the Annual Report of the Norwegian Department of Agriculture for 1893 it is stated that one of the essential causes of the yearly increasing export of butter from Norway is the steady growth of the consumption of margarine in that country. In 1890 the total quantity of margarine produced in Norway was 92,000 cwts., and of this quantity about one-fifth was exported, leaving over 70,000 cwts. for home consumption. The output of margarine from Norwegian factories in 1893 was 160,000 cwts., and, deducting exports for the same period, there remained 130,000 cwts. for home consumption.

SUNFLOWER-SEED CAKE.

The high nutritive value of Russian sunflower-seed-meal as a fodder for animals is attracting some attention in Germany. Recent analyses of the meal by Dr. R. Theodor have appeared in the *Deutsche Landwirthschaftliche Presse*. His opinion, after reviewing the analyses of previous investigators, is that the per-centage of albuminoids in sunflower-meal may now be confidently stated at a higher figure than has hitherto been the case.

Some previous analyses have given results ranging from 44.44 to 47.62 per cent. of albuminoids, and from 12.02 to 13.50 per cent. of fat. Dr. Theodor, however, finds that in the case of finely-sifted meal the relative proportions may be as high as 49.3 per cent. albuminoids to 11.44 per cent. fats. The amount of water is stated to vary from 4 to 10 per cent.

As regards the best form in which to utilise the meal a difference of opinion appears to exist amongst agriculturists, some being in favour of mixing the meal with water, while others prefer to use it in the dry state. The former method is, as Dr. Theodor observes, open to the objection that the meal does not diffuse itself uniformly throughout the water, but falls as a precipitate to the bottom of the vessel. Consequently there is need of unremitting attention to keep the vessel perfectly clean as a precaution against the growth of mould-fungi, which otherwise would soon appear and render the water and food-stuff not only useless but even injurious.

It appears, therefore, that the dry method, in which the meal is merely sprinkled upon roots, straw or chaff, is upon the whole preferable. Most oil-cakes can readily be broken up into a fine meal, but sunflower-cake is, it seems, an exception. It is so hard that cattle find some difficulty in chewing the larger pieces. For this reason it is considered advisable to grind it before use into as fine a meal as possible in order to render it more digestible.

Many agriculturists prefer to use the cake coarsely ground rather than finely ground, apparently under the impression that the additional salivation induced by masticating a coarser food renders the meal more readily digested in the stomach. But it is pointed out by Dr. Theodor that ptyalin, the active principle of the saliva, acts only upon insoluble starch-containing substances, converting them into soluble grape sugar, whereas upon albuminoids and fats it has no action whatever. Digestion of albuminoids and fat does not commence until these materials reach the stomach and intestine. The additional mastication is, therefore, of advantage in the case of food containing starch, but for abuminoid and fats it is by no means essential.

As regards digestibility, it has been shown by Dr. E. von Wolff that in the case of sunflower-seed-cake about 89.6 per cent. of the raw albuminoids and about 87.9 per cent. of the

raw fats are digested. In the case of cottonseed-cake, which seems to closely resemble sunflower-cake in this respect, the coefficients of digestibility have been stated by the same author to be 84·7 per cent. for albuminoids and 87·6 per cent. for fats.

EFFECT OF CARBON BI-SULPHIDE ON THE YIELD OF CROPS.

M. Girard has recently read a paper before the Société Nationale d'Agriculture in which he states that it is now an established fact that carbon bi-sulphide, when applied in large quantities to the soil, increases the abundance of a crop to a remarkable degree. This fact he claims to have demonstrated in a series of experiments carried out during the last four years. It is curious to note that it was only through an indirect channel that M. Girard's researches led him to the conclusions at which he ultimately arrived. In 1886 he announced the discovery of a variety of nematode, *Heterodera Schachtii*, upon the roots of sugar-beet in France. As the ordinary insecticides were found to be quite inoperative in fields upon which the parasite had once become thoroughly established, M. Girard decided to try the effect of applying large doses of carbon bi-sulphide. When tentatively applied to crops only partially infested, this local treatment proved in numerous instances a complete success. It was on a farm at Joinville-le-Pont, in the Department of Seine, that the first experiments were conducted, while the first practical application to a crop took place on a farm at Gonesse, in the Department of Seine-et-Oise, in 1887. By injecting into the soil a dose of carbon bisulphide representing not less than 72½ lbs. per 120 square yards it was found, although at the cost of complete sacrifice of the beetroot crop, that all the parasites infesting the crop were destroyed.

Upon the same field in which the beetroot had been grown, and of which 240 square yards had been subjected to the treatment above described, a crop of wheat was sown, in 1888, in the ordinary manner. At the beginning of June it was observed that upon the plot treated in 1887 with sulphide the wheat was much more upright and healthy, and from 4 to 5 inches higher, than upon the rest of the field. After the verification of these facts a second plot of equal area was measured off in the same wheat-field in order that comparison might be made between the production of the two plots. It was found that the area treated with sulphide yielded no less than 46·8 per cent. more grain and 21·73 per cent. more straw than the plot which had not been so treated. In order to thoroughly investigate the nature of this action, two series of experiments were conducted in 1889, the dose applied being the same as before. At Gonesse, a plot of 360 square yards which was about to be sown with wheat, and at Joinville, a plot

of 600 square yards to be planted with potatoes, were treated with sulphide. By the side of these sulphurated plots equal areas which had not been so treated were reserved to constitute control plots.

Unfortunately, all the wheat at Gonesse was laid, and it was found impossible to weigh it; but at Joinville the potato crop upon the 600 square yards sulphurated showed an increase of weight varying from 5.3 to 38.7 per cent. A more methodical series of experiments was carried out in 1891 and 1892. At Joinville, a piece of poor gravelly soil was selected. Two strips of 600 square yards each were measured off side by side. One was surrounded by a ditch a yard wide and a yard deep; the other remained in communication with the surrounding soil. Neither of these strips received any manure. The one surrounded by ditches was dosed with 72.6 lbs. carbon bi-sulphide per 120 square yards. Each strip was then divided into five squares of 120 square yards each, in order that comparison might be made of five separate crops, viz., wheat, oats, beet, potatoes, and clover. The result showed an increased yield upon the sulphurated area similar to that which occurred in 1888 and 1889. This increase was especially remarkable in the case of clover.

Finally, in 1892, in order to determine whether the influence of carbon bi-sulphide may be prolonged beyond one year, the same crops were sown upon the same areas, the relative positions, however, being changed. There was no application of manure, nor of sulphide. Once more an increase of crop occurred, but much more marked than in the preceding years, owing, it is considered, to the influence of the drought upon the normal cultures in a soil so poor as that of the farm in question. The results of the entire series of experiments carried out in the years 1888, 1889, 1891, and 1892 may be briefly summarised as follows:—Comparing the sulphurated sections with the control plots, it appears that on the former areas there was an increased yield of wheat ranging from 15 to 46 per cent. in the grain and from 21 to 80 per cent. in the straw. Potatoes on the sulphurated section gave an increased yield of from 5 to 38 per cent., and the production of beetroot was from 18 to 29 per cent. superior to the yield obtained on the control plots. Clover gave an increased yield on the treated areas ranging from 67 to 119 per cent.; and in the case of oats the treatment produced, in 1891, an increase of 9 per cent. in the grain and 30 per cent. in the straw; while at Joinville, in 1892, the oats on the sulphurated plots are stated to have shown an increase of 100 per cent. in grain, and 60 per cent. in straw.

These results are considered to show most unmistakably the effect produced upon the yield of a crop by the injection of carbon bi-sulphide into the soil. It must be remembered, however, that the experiments were conducted on comparatively small areas.

Discussing the immediate causes of the increased yield, M. Girard thinks it may be within the bounds of possibility that the carbon bi-sulphide acts as a stimulant to vegetation; but he suggests as a more natural hypothesis that the specific in question acts as a poison to insects and lower organisms inhabiting the soil and attacking the roots of plants. Perhaps that may be the case; but there is apparently no direct evidence to show that the sulphide exercises an action directly deleterious to micro-organisms. On the contrary, some micro-organisms are said to be capable of resisting its action, and, as an example of this, mention is made of the bacteria found at the roots of leguminous crops; for it was in the case of clover, the roots of which were in every case loaded with nodules, that the increased yield was most marked in the experiments referred to above; the same remarks apply generally to agents capable of fixation of nitrogen, nitrifying microbes, etc. As a matter of fact, the crops of 1891 and 1892 were obtained without the addition of any manure. M. Girard is unable to express any opinion on the question as to the action of the sulphide upon the cryptogamic growths which occur so frequently upon the roots of plants. This point, it appears, has not hitherto been the subject of thorough investigation. Until further researches have been made, he inclines to the view that the carbon bi-sulphide acts principally upon insects which inhabit the soil and obtain their food by gnawing and wounding the rootlets, whose function it is to supply the foliage of the plant with nutriment. This view of the mode of action of the sulphide is stated to be strikingly confirmed in the actual practice of sulphuration in large doses. As the treatment proceeds, numbers of insects of all kinds are seen rushing here and there, struggling to escape, but they succumb eventually to the effects of the sulphurous vapour.

As regards the practical application of the treatment for the purposes of agriculture, M. Girard points out that doses of carbon bi-sulphide, such as those referred to above, are absolutely incompatible with the conditions of ordinary agriculture; they represent a cost amounting even at the lowest estimate to more than 16*l.* per acre; but he questions whether doses so strong are absolutely essential, and whether there may not be a point at which the cost is compensated by the increased value of the crop. M. Girard hopes to be able to throw some light upon this subject before the end of the present year.

PRODUCTION OF WOOL IN VICTORIA.

In an article in the *Victorian Year Book* 1893 on the production of wool in Victoria, Mr. Hayter, C.M.G., the Government statist of the Colony, states that the general lambing season in Victoria

extends from April to June for merinos, and over June and July for crossbreds. In ordinary seasons shearing commences in the early districts in the beginning of September and continues to the end of the year, the bulk of the wool being shorn in October and November. By the first week in October the new season's clip is arriving freely in Melbourne and Geelong; the wool sales then begin, and are held almost daily until within a couple of days of Christmas. They are usually resumed during the second week in January, and continued until about the end of February. From March to September inclusive, small sales of oddments are held intermittently.

The quantity of wool produced in Victoria during the year 1892 is estimated at 80,505,334 lbs., valued at 3,523,954*l*. These figures represent the excess of exports over imports during the year, to which is added the quantity and value of wool used in Victorian woollen mills. In the previous year the quantity produced, similarly estimated, was 76,503,635 lbs., valued at 3,957,901*l*.

The estimated average weight of a fleece of greasy wool grown in Victoria is $5\frac{1}{4}$ lbs. for merino, and 6 lbs. for crossbred and longwool sheep; the former varying from a maximum of $9\frac{1}{2}$ lbs. (which was averaged by a flock of 11,000) to a minimum of $3\frac{1}{2}$ lbs.; and the latter from a maximum of 9 lbs. to a minimum of $4\frac{1}{2}$ lbs.

The estimated loss in weight of Victorian grown wool in scouring clean, fit for the manufacturer, is about 55 per cent. (yield 45 per cent.) on merino, about 40 per cent. (yield 60 per cent.) on crossbred, and about 30 per cent. (yield 70 per cent.) on Lincolns and other longwools; whilst the estimated loss in weight for hot-water washed merino is about 16 per cent. (yield 84 per cent.), and for cold washed about 36 per cent. (yield 64 per cent.).

The average price of Victorian wool in 1892, based upon its declared value before leaving the Colony, as obtained from the Customs returns of exports, was 9*d*. per lb. for greasy wool; $14\frac{1}{8}$ *d*. for scoured; and $14\frac{1}{4}$ *d*. for washed; whilst the average for the whole was $9\frac{3}{4}$ *d*., as against $10\frac{3}{8}$ *d*. in 1891, not quite $10\frac{3}{4}$ *d*. in 1890, nearly $10\frac{1}{2}$ *d*. in 1889, not quite $10\frac{1}{8}$ *d*. in 1888, nearly $10\frac{5}{8}$ *d*. in 1887, $11\frac{3}{8}$ *d*. in 1886 and 1885, and $12\frac{7}{8}$ *d*. in 1884. There was thus a fall in the price as compared with all the previous years named—of $3\frac{3}{4}$ *d*. per lb. as compared with 1884, of $1\frac{5}{8}$ *d*. per lb. as compared with 1885 and 1886, and from $\frac{3}{8}$ *d*. to 1*d*. as compared with other years. This would depreciate the wool produced in Victoria during 1892 between 128,000*l*. and 341,000*l*. as compared with the average price in the years immediately preceding, by about 550,000*l*. as compared with the average price in 1886 or 1885, and by over 1,000,000*l*. as compared with the price in 1884.

AGRICULTURAL LABOUR IN JULY.

The *Labour Gazette* of August contains a report by Mr. Wilson Fox, the Agricultural Correspondent of the Labour Department, on the state of agricultural labour in July. In England and Scotland agricultural labourers are reported to have been well employed during July at mowing, hay-making, hoeing turnips, weeding, and picking fruit.

In Norfolk, Suffolk, Essex, and Cambridgeshire, where employment was irregular until June, the men, with few exceptions, were able to obtain regular employment throughout July, except where loss of time was caused by wet weather.

Irregular work due to the weather is said to have been experienced in a few localities of Suffolk. In some districts, however, the wet weather had the effect of increasing the demand for labour at the end of July, by retarding hay-making operations and causing a rapid growth of weeds.

Harvest in the eastern counties had scarcely begun at the date of the report, but there appeared to be every prospect of the labourers all being fully employed and securing good terms owing to the abundance of the crops and the fact that cutting by hand had been rendered necessary by the heavy rains. In North Suffolk it was estimated that the harvest would require at least 40 per cent. more labour than last year, and it was asserted that in some districts labour would be difficult to obtain.

Up to the end of July the wages for harvest work in Suffolk are stated to have varied from 6*l.* 10*s.* to 8*l.* 10*s.*; while in some districts the men refused to take less than 7*l.*

In Norfolk and Essex it was expected that wages would vary from 6*l.* 10*s.* to 7*l.* 10*s.*, and that all spare men would be employed.

Farmers in the northern part of Cambridgeshire and southern part of Lincolnshire were anticipating an expensive harvest, and it was feared that, unless more Irishmen than usual came to those districts, there would be a great scarcity of harvest hands.

In northern Lincolnshire, on the other hand, some casual men were reported to be out of work in July, but these would in all probability easily find employment as soon as harvest commenced.

In the midland counties the men were fully employed during July, the hay crop being abundant, and harvest prospects looking very favourable to the employment of labour.

In the home counties also the men are said to have been fully employed during July.

In the western and southern counties no lack of employment was reported, except at Trowbridge, in Wiltshire, up to hay time, and after that commenced the demand exceeded the supply. It was expected that in those counties as elsewhere all available hands would be required for harvest.

Reports from Perthshire and neighbouring Scotch counties stated that the labourers were all in work.

No strikes had been reported, though in some cases in Suffolk men had refused the price offered for harvest work.

It appears that less than the usual number of Irish labourers had arrived, at the date of the report, in English and Scotch agricultural districts to assist in the harvest work.

According to information furnished by the Midland Great Western Railway, the Irish labourers booked by that railway to England and Scotland were 22,420 in 1894, as compared with 23,534 in 1893 and 27,050 in 1892. Statements obtained from the shipping agents show that the total numbers booked by steamer were 22,970 in 1894, 24,269 in 1893, and 28,270 in 1892.

These numbers practically represent all Irish labourers who come from the province of Connaught. Nearly all the other Irish migratory labourers are stated to have come from Ulster, and by far the larger portion of these from Donegal, from the northern parts of which county they go chiefly to Scotland and Northumberland. The Connaught men are reported to go chiefly to Lancashire, Yorkshire, Cheshire, Derbyshire, and Warwickshire, while some go to Scotland, Northumberland, and Lincolnshire. Practically all the women go, it is stated, to Scotland, where they find employment in thinning turnips, weeding, harvesting, potato lifting, etc.

The period of absence for both men and women is said to vary from three to nine months.

The decrease in the number of migratory labourers from Connaught is attributed partly to improved circumstances of the people in Ireland and partly to diminished demand for labour in England owing to agricultural depression and to the increased use of machinery. This year, however, it was expected that Irish labour in England would be more in demand than for some years past.

The bulk of the Connaught labourers leave Ireland from June 8th to the end of July, but the Donegal men leave in August for Scotland and Northumberland, where the harvest is later.

It is stated that the numbers from Mayo who left by rail and boat during the present year up to July 31st were only 18 less than the number for the whole of 1893, without estimating the number of harvesters from Achill who were drowned in the Westport disaster. Thus the decrease has taken place in other counties.

The total number of those who left Mayo this season is estimated at 19,290, which amounts to 37 per cent. of the male population of 20 years of age and upwards in that county, and to no less than 83.9 per cent. of all those who left from Connaught.

XIV.—EXTRACTS FROM DIPLOMATIC AND CONSULAR REPORTS.

WHEAT-GROWING IN TEXAS.

In a report on the agricultural condition of Texas, dated 18th June last, Mr. H. D. Nugent, Her Majesty's Consul at Galveston, furnishes the following information on the subject of wheat growing in that State :—

Wheat is not cultivated very extensively over the State of Texas on account of the production of other crops which pay the producer better for his labour, and the only sections where wheat is grown is over the Panhandle, north and central portions of the State. Winter-wheat is the only kind cultivated in these sections, and the average time of sowing ranges from October 20th in North Texas and the Panhandle, to October 24th over Central Texas. Wheat with favourable weather goes off well and generally commences heading about May 5th, when there is a fair stand, as this has something to do with the heading and ripening of the crop. The average date of harvesting is about June 9th. The average yield for the eight years is 10·9 bushels per acre, which is a fair yield and greater than any other State south of the 38th parallel of latitude east of the Rocky Mountains.

The weather as a general rule is very favourable for the crop. The dry weather, which occurs occasionally after wheat is sown in the fall, causes the plant to come up and grow off poorly, and thereby injures the crop to some extent, as it keeps it from spreading and reduces the yield generally. A warm spring results in wheat growing rapidly, which increases the probability of the crop being injured by cold weather late in the spring, although wheat will stand a lower temperature than the other products, yet it requires an average temperature of about 55 degrees before it will mature. Heavy rains in April and May injure the crop to some extent, especially if they occur about the time the plant is heading. The crop is sometimes slightly damaged by insects in April and May, but, as a rule, the injury from this cause is less than in some States farther north. It is observed that in years with temperature and precipitation about normal, and with the precipitation well distributed, there is generally a fair crop.

The acreage of wheat in Texas varied from 520,219 acres in 1887 to 359,440 acres in 1890, and to 559,382 in 1892. The total production was 5,174,454 bushels in 1887, 2,365,253 bushels in 1890, and 6,553,575 bushels in 1892.

The average production per acre in 1892 showed a decrease from 1891, being 11·30 bushels, as against 15·34 bushels, and there was also a decline in the average price, from 3s. 1½d. per bushel in 1891 to 2s. 3½d. in 1892. This is in accordance with the tendency all over the States where lower prices and consequent diminution of gross returns in wheat per acre have been very marked during the last 10 years.

There has been a constant decrease of wheat sown in the northern part of Texas, where up to 1891 the bulk of the wheat produced in the State was grown. This decrease has been counteracted by the opening of new farms in the Panhandle, which is fast becoming the granary of the State. The soil and climate there are admirably adapted to wheat culture, and it is hoped that ere long, with favourable circumstances, that part of Texas will supply enough wheat for home consumption and also for exportation.

The amount of wheat consumed *per capita* throughout the United States is estimated at $4\frac{2}{3}$ bushels. Under this calculation 10,432,442 bushels were necessary for Texas consumption in 1892, whereas only 6,553,575 bushels were produced, leaving 3,878,867 bushels to be imported.

[*Foreign Office Report, Annual Series, No. 1431.*]

THE DAIRY INDUSTRY IN DENMARK IN 1893.

Mr. A. P. Inglis, Her Majesty's Consul at Copenhagen, reporting on the agriculture of Denmark during 1893, states that dairy farming had to encounter many difficulties, not so much from short winter fodder, as stocks remaining over from the previous year were ample, but owing to ice obstructions which caused considerable uncertainty in sales.

The short supply of grass in the dry summer caused a falling off in the yield of milk, and the low prices ruling from December to July, when milk is most abundant, were far from being made up by the better quotations during the remaining months of the year.

The surplus exports of butter, however, exhibited a considerable increase of over 16,500,000 lbs. (avoir.) more than the average for the previous five years, and 2,970,000 lbs. more than in 1892, but the export of eggs, though larger than the average for the five years' period, was 1,300,000 scores less than the year before.

The courses for dairy instruction were well attended to by men and women, and travelling instructors were engaged to act at vacant posts when necessary.

The Agricultural Society also undertook to supply dairy hands to its members who, on account of the presence of foot-and-mouth disease amongst their stock, were in need of extra assistance, their delivery of milk to the co-operative dairies being stopped.

The grant for the improvement of domestic animals was increased 6,940*l.*, of which 2,222*l.* were for horses, 3,333*l.* for cattle, 555*l.* for consulting experts, and 884*l.* for other purposes.

A further annual grant of 2,775*l.* for five years was made to assist farmers in combating tuberculosis in horned cattle.

[*Foreign Office Report, Annual Series, No. 1430.*]

EXPORTS OF BUTTER FROM HAMBURG.

The Hon. C. S. Dundas, Her Majesty's Consul General at Hamburg, writing on the export trade in butter from that port, remarks that it is a great question as to how much of this article which is supplied to foreign markets is genuine butter. It is a well-known fact that the sale of genuine butter in the country is safeguarded from compounds known under the designation of butter. But this, it appears, does not operate in the case of the exported article, and the large quantities imported into Hamburg undergo a great deal of manipulation in that city in the processes of washing and blending, so that it is a difficult matter, and one upon which only experts can pronounce to decide whether the butter sent out is pure and unadulterated. The opinion of outsiders seems to be unanimous in condemning it as an adulterated article.

[*Foreign Office Report, Annual Series, No. 1432.*]

CHICAGO GRAIN TRADE.

Colonel Hayes-Sadler, Her Majesty's Consul at Chicago, in a report on the trade of that city in 1893, states that the receipts and shipments of flour were about one-third less than in 1892; the receipts of wheat fell of by nearly 15,000,000 bushels, and the shipments by 19,000,000 bushels. Money stringency told on a low market, and wheat suffered in common with other products, prices ruling lower than at any former period. The harvest produced considerably less than in the preceding year, which again showed a large falling off from the yield of 1891, so that, with the low price of cereals, farmers realised little profit, and dulness pervaded the operations of dealers. Although the demand in European markets was fair, the competition of Russia at low prices prevented any tendency to a rise at Chicago. The cash price of No. 2 wheat averaged only 2s. 9½d. a bushel, against 3s. 3¼d. in 1892 and 3s. 11½d. in 1891, and at one time in July the price was as low as 2s. 3d. a bushel.

Though influenced by the general low price of cereals, the oat market was steady and firm as compared with those of wheat and corn, and the receipts and shipments exceeded those of 1892. The average price per bushel was 1s. 2d., compared with 1s. 3½d. in the preceding year.

The average price of rye fell from 2s. 9½d. in 1892 to about 1s. 10d. last year, and the market was dull, export business to Europe having been restricted by the abundant supply furnished from Russia.

A less quantity of barley was also received, and the demand for breweries, which on account of the World's Fair was expected to be large, failed to realise expectations.

The total receipts of cereals in 1893 was valued at 21,675,000l., against 26,021,000l. in 1892.

[*Foreign Office Report, Annual Series, No. 1438.*]

AGRICULTURAL DEPRESSION IN DENMARK.

Mr. A. P. Inglis, Her Majesty's Consul at Copenhagen, in a recently issued report on the agriculture of Denmark, quotes several passages from a report by Captain J. C. Lacour on the position of agriculturists in Denmark in the year 1893.

Captain Lacour refers to the universal depression in agriculture, and the increasing difficulties which threaten this industry; among these are instanced the rapidly growing competition of Australia in the English butter market; low prices for produce; isolated cases of disease among cattle, of themselves causing only slight losses, but gaining importance owing to prohibitive measures adopted in countries which afforded the best outlet; stagnation of trade in general; and diminished consumption of farm produce consequent thereon. On the other hand, it is shown that things have not been better in other countries, and that for an important item in the Danish exports, viz., pork, good prices were obtained.

Cattle and meat gave very poor returns, the English coal strike being instanced as one of the causes. Stock had to be sold at any price owing to short supplies of fodder, while at the same time imports to the English market from Australia, La Plata, and other sources, amounted to 4,000,000 carcasses, a trade unknown 13 years ago. Owing to prohibitive measures adopted in neighbouring countries, the export of fresh meat had to be resorted to, and abattoirs under the supervision of Government inspectors were established in Copenhagen, Esbjerg, and Aalborg, but owing to the meat thus exported not always being in the best condition, results obtained did not fulfil expectations. Many old stock-raising farms are said to have gone over to dairying.

The decline in demand for horses from abroad, concurrently with increased production and scanty supplies of fodder, caused a fall in prices. The imports of light horses from Russia rose considerably; 10,800 horses were exported from Denmark in 1893, and about 5,800 imported.

Pigs presented an exception to the general depression, prices being higher than in 1892, which was considered a good year, especially in the trade with England.

The gross value of the harvest for the whole country was 14,693,906*l.*, being a decrease of about 3,000,000*l.* compared with 1892, or about 18·6 per cent. This was caused to a great extent by a falling off in quantity, for while prices for some produce have been lower, in other cases they have been somewhat higher; compared with the average for the previous five years the value in 1893 shows a decrease of 2,200,000*l.*, or 13·3 per cent.

The cultivation of wheat shows a considerable decline, not only have the imports of this cereal increased, but the surplus export of flour has gone down to under one-seventh of what it

was 10 years ago; the amount sent abroad in the 'Eighties being often over 982,000 cwts. This is explained by the fact that Danish millers are unable to find an outlet for one-half the quantity of flour they formerly sold, exports to the English market having virtually ceased owing to American, German, and French competition. The same is the case with Sweden owing to the duty on flour levied in that country. At the same time the imports into Denmark of foreign flour have risen to 167,000 cwts., against an average for the last 10 years of 68,750 cwts.

The large imports of Black Sea barley are referred to as being likely to exercise a serious effect, should it find its way to the breweries, which have hitherto been the best customers for the home-grown cereal.

The largest imports of foreign grain are under maize, of which over 2,860,000 bushels were imported; of this, 1,500,000 bushels went to the distilleries.

During the autumn and winter considerable shipments of pressed hay and straw were exported by way of Esbjerg at good prices.

Exports of cattle, sheep, and swine all show a falling off, but in the case of the last the decrease was more than made up by the large exports of bacon, bringing up the total to 200,000 head of swine, or more than double the total for the foregoing five years.

A noticeable feature in M. Lacour's report is a reference to a tendency on the part of labourers to migrate back from the towns to the country, and the more abundant supply of hands thus made available is mentioned as one of the bright spots of the year.

[*Foreign Office Reports, Annual Series, No. 1430.*]

DEMAND FOR AGRICULTURAL MACHINERY IN TURKEY.

Mr. W. H. Wrench, Her Majesty's Acting Consul General at Constantinople, in a report dated 10th May 1894, says:—

“It seems a curious fact that agriculture in European Turkey and round the capital is more backward than in other parts of the Empire. In Bulgaria I am told that agricultural machines are being extensively introduced; and they are also found near Smyrna and at Mersina. In Constantinople the sale is most restricted. The native farmer is ultra conservative in his methods, and requires much persuasion to overcome his dislike to Frankish contrivances which he will not take the trouble to understand, and which, once broken, are difficult to repair. Even when he sees a reaping machine working, and recognises its superiority, he is not convinced. The pity is that those who should set an example, and encourage the people to improve their methods, have not the will or the energy to do so.”

"I was told of a Turkish farmer, up country, who, after watching a reaping machine at work, exclaimed, 'If these things are so good, why does not our Padishah show them to us?' It might certainly be thought that the introduction of simple suitable machinery would come within the scope of the Minister of Agriculture's duties. There are farms near Constantinople belonging to the Sultan, administered by the Minister of the Civil List. Some years ago the bailiff in charge had several machines working, and invested in others. He was removed or died, and his successor has returned to the old primitive methods."

"The opening of the country between here and Angora, and the development of agricultural activity which is resulting from it, should lead to an increased demand for machines. The machines most suitable for this country, where the ground is very rough, and gets baked hard in the summer, are not necessarily those preferred in England."

"This is a point which English makers either lose sight of, or do not think it worth their while attending to. One instance of this is that the reaping machines which give most satisfaction are American. They are lighter than the English, and the iron work is not so brittle, and is better able to stand the hard usage over the rough ground. Quick reaping is of great importance here, as the grain ripens very quickly."

[*Foreign Office Report, Annual Series, No. 1384.*]

GROWTH OF CEREALS IN ASIA MINOR.

Mr. W. H. Wrench, Her Majesty's Acting Consul General at Constantinople, states that the opening of the Anatolian Railway to Angora has enabled growers in the interior to bring down their produce to the sea, and a new trade has sprung up at Ismidt within the last year. Last year 70,000 quarters of barley of 400 lbs. were shipped from Ismidt to England.

The Eskishehr barley is of good quality, almost as good as Smyrna ushaks; in fact a good deal of it was taken to Smyrna, at an extra expense of 5 per cent., and sold there as ushaks for export to England.

The prices began at 1*l.* 4*s.* 6*d.* per quarter for Eskishehr barley, c.i.f., any port in England; and dropped later to 1*l.* 2*s.*

This trade with the interior promises to develop. Last year's crop of linseed was a failure, and the prices for wheat were too low to tempt sellers; otherwise both these cereals, and maize also, could be brought down in large quantities.

As regards the province of Aleppo, however, Mr. S. S. Jago, Her Majesty's Consul at that city, reports that during the year 1893, wheat and barley, the mainstays of the country, were exported in insignificant quantities owing to the competition in

Europe of American, Indian, and Russian cereals, coupled with the heavy transport charges on camel-back from the interior. The total quantity exported in 1893 was limited to 2,000 tons of oats, the produce of the coast line, a demand for which exists in the south of France, whilst in 1891, 19,000 tons of cereals were exported, and in 1892, only 7,000 tons.

AGRICULTURE IN NORWAY.

Mr. T. Mitchell, Her Majesty's Consul General at Christiania, in a report on the trade of Norway, gives some particulars concerning the agriculture of that country in 1893.

In 1893 the spring was very favourable and hopes were entertained of a good year. These were considerably lessened in the southern and western districts, including Stavanger, by the long drought and great heat which lasted until midsummer, when rain began to fall. The harvesting was done under favourable conditions. The result in those parts of the country was that the hay crop was somewhat under the average, while corn and potatoes gave a good profit, and all the products were of good quality.

In the Prefectures of Bergen, Romsdal, and Trondhjem the harvest was very satisfactory.

No favourable results for 1893 are to be recorded from the province of Tromsö, which suffered considerably in 1892.

The Prefect of Nordland reports that the bad weather in summer and autumn had destroyed not a small part of the crops and hindered the development of the remainder.

In the Prefecture of Finnmarken the frost did much damage to potatoes, but the crop of hay may be regarded as satisfactory.

Dairy farming was only middling. Owing to competition with margarine it is more and more difficult to dispose of second class butter ("dairy butter") and "peasants butter," at acceptable prices.

The milk-condensing companies had a bad year. The factories at Hamar and Sannesund limited their working considerably, and those at Toten and Drammen were scarcely worked at all.

[*Foreign Office Report, Annual Series, No. 1427.*]

THE BEET SUGAR INDUSTRY IN GERMANY.

The Hon. C. S. Dundas, Her Majesty's Consul General at Hamburg, in a report dated 20th June 1894, gives some details of the manufacture of beet sugar in Germany.

German sugar is manufactured entirely from beet root which, is cultivated by farmers who have an interest in the sugar

factories. The average yield of sugar in the beet is from 14 to 15 per cent., and in order to secure a good yield the roots destined for culture are selected solely with regard to the percentage of their yield of sugar. Therefore the excellence of the root in regard to yield and the production of the seed is a matter of the first importance. The plant most in demand is the little Wanzleben.

The factories consume 200 tons to 1,000 tons of beetroot daily, according to size or working capabilities.

The process is as follows:—The roots cut into strips areedulcorated with warm water, and the juice thus obtained is clarified by means of lime. The residue left is then subjected to a process by which all moisture is extracted by means of presses and utilised as provender, which has been found very serviceable. A second and third purification with carbonic and sulphurous acid follows, and the syrup and crystallisation operations by evaporation and boiling give the final production of the manufactured article, which is separated by centrifugal machinery from the syrup. The deposit left from this process is the molasses which is so much used in the manufacture of spirit. The number of factories in Germany in 1891 was 406 equipped with 4,717 steam engines of 68,691 horse-power, using up 10,623,319 tons of beets, and yielding 24,273,784 cwts. of sugar, and 4,815,922 cwts. of molasses.

[*Foreign Office Report, Annual Series, No. 1432.*]

LIGHT RAILWAYS IN BELGIUM.

The following information respecting the Belgian light railways has been extracted from a report by Mr. Leech, 3rd Secretary of Her Majesty's Legation at Brussels, explaining the organisation of the Agricultural Department of Belgium, which was published, together with several reports of a similar nature for other countries, as a Parliamentary paper in June last.

In 1885 the Belgian Government, with a view to alleviate the agricultural and commercial crisis through which the country was passing, addressed circulars to the provincial governors, inviting their consideration to the proposed creation of Vicinal railways ("Chemins de Fer Vicinaux"), and expressed their intention of doing all in their power to further the establishment of these new means of communication.

It was set forth that although roads had been greatly improved of late years, no steps had been taken to facilitate the mode of transport upon them.

It was therefore proposed to lay down these railways along existing roads, so that they might be constructed at small expense, and economically administered, to afford the people a

cheap means of transporting themselves and the produce of their labour.

The Vicinal railways were to be connected with the Main railways, and it was contended that they would not only facilitate intercourse between the different communes, and between them and the larger towns, but would introduce new industries and increase the prosperity of those already existing by the opening out of new markets. They would also enable the farmer to obtain cheap manure, and by the lowness of the rates permit him to send his produce rapidly to market as well as abroad.

This proposal received the unanimous approval of the provinces.

The "Société Nationale des Chemins de Fer Vicinaux" was accordingly started, which to-day owns 67 different Vicinal railways, varying in length from 2 to 25 miles, and covering in all 790 miles, being a proportion of 28 per cent. to the 2,820 miles of Belgian main railways.

The "Société Nationale" possesses the monopoly of all Vicinal railways, the capital being derived from four sources, which contribute the following average proportions:—The State, 27 per cent.; the provinces, 28 per cent.; the communes, 41 per cent.; and private individuals, 4 per cent.

The capital is represented by shares bearing a maximum interest of $4\frac{1}{2}$ per cent. after payment of working expenses.

Any surplus is divided as follows:— $\frac{1}{4}$ to an improvement fund, $\frac{3}{8}$ as a bonus to shareholders, $\frac{3}{8}$ to the reserve fund.

The President of the Society is appointed by the King, and the members of the Administration half by the King and half by the shareholders.

All requests for Vicinal railways must be addressed to the "Société Nationale," accompanied by statements as to the population of the district through which the railway is intended to pass, the industries which would benefit thereby, a plan of the route, and the opinion of the local authorities as to the utility of the line.

The decision as to whether the line shall be constructed or not rests entirely with the "Société Nationale."

The tariff on the Vicinal railways has been established on the following bases for consignments of not less than five tons:—

		Rate A.	Rate B.	Rate C. (Heavy Goods.)
		Per Ton.	Per Ton.	Per Ton.
Fixed tariff, for any distance	-	4·8d.	4·8d.	4·8d.
Variable tariff, per mile	- -	2·02d.	1·70d.	1·08d.

Special Tariff.(Established with the view of assisting the transport of
agricultural produce.)

No. 1.		No. 3.	
Fixed tariff, for all distances -	Per Ton. 4·8 <i>d.</i>	Fixed tariff, for all distances	Per Ton. 14·4 <i>d.</i>
Variable tariff, per mile -	0·62 <i>d.</i>	Variable tariff, per mile -	2·3 <i>d.</i>
		Application of Rate C to consignments of 4 tons.	

Important reductions have been made in the above tariffs, while No. 1 and No. 3 have been specially established with a view to facilitating the transport of agricultural produce.

The majority of commodities which come under Special Tariff No. 1, such as salt, manure, coal, and beetroot pulp, are either used for, or are the product of, agriculture. They formerly came under Rate C; therefore the reduction is a concession of 0·46*d.* per ton per mile.

Special Tariff No. 3 is principally for the transport of animals, and is said to be exceedingly advantageous.

A reduction has been made from five to three tons as the minimum weight for straw, fodder, flax, and hemp.

Receptacles for milk, butter, eggs, and for general farm produce can be returned empty free of charge.

A reduction to 1·08*d.* per ton per mile has been introduced for the variable tariff of Rate A and B in favour of cereals, meal, bran, chicory, potatoes, fresh fruit, forage, straw, vegetables, and raw flax.

No charge is made for vegetables, fruit, butter, cream, cheese, eggs, and poultry carried by agriculturists and destined immediately for market.

Free carriage is also granted for milk personally delivered by the country people at the houses of their customers.

HORTICULTURE IN TEXAS.

Mr. H. P. Nugent, Her Majesty's Consul at Galveston, states in his report on the Agriculture of Texas that the total acreage in orchards in Texas was, in 1891, 68,654 acres, and the value of the fruit crop, estimated at current prices, 355,450*l.* In 1892 the acreage was 70,075, an increase of 1,421 acres over 1891; the value of the crop, however, decreased to 335,910*l.*

The most important fruit crop in Texas is, it appears, the

peach crop. From 1888 to 1892 the average acreage in peaches has been about 55,000 acres. In 1892 it was 53,848 acres, an increase of nearly 2,000 acres over 1891. During the five years from 1888 to 1892 the value of the peach crop is estimated to have averaged about 250,000*l*. In 1892 it was 267,000*l*. Texas enters the western markets with peaches as early as June. They can be sold at 25*s*. per bushel, and this State has the almost entire monopoly of the western and north-western peach market until nearly August.

The crop next in importance to peaches is the melon crop. During 1888 to 1892 the average acreage under melons was about 12,500 acres, and the average value of the crop 96,700*l*. The acreage in 1892 was 15,067, and the value of the crop 89,060*l*.

Apples grow all over north Texas in great variety and perfection. During the past five years the average acreage under apples has been about 10,000 acres, and the average value of the crop 53,330*l*. The acreage in 1892 was 9,882, and the value of the crop 40,370*l*.

The European varieties of grape are chiefly grown near Rockport, and can be successfully cultivated from Port Lavaca to Brownsville. They are ready for market early in June, and fetch on an average 11½*d*. per lb. They yield from 30 lbs. to 100 lbs. per vine, and are grown without any expense for wires or training in any way. The American variety of grape flourishes all over the State, and with proper attention yields over 20*l*. per acre. The coast district of Texas is said to be particularly favourable to American grapes, such as the Delaware and Concord varieties, especially as the dreaded black rot is little known.

The average value of the grape crop in Texas from 1888 to 1892 was about 29,160*l*.; in 1892 it was 32,065*l*.

The acreage of pears has risen steadily from 878 in 1888 to 2,950 in 1892. The average value of the crop during these five years was 11,666*l*. As a specimen of what can be done, Mr. Nugent mentions a pear orchard in Galveston county, the proprietor of which last year sold 9,127 bushels off 13 acres only; he paid out nearly 20*l*. per acre for services and harvesting expenses, and yet the crop netted him 1,092*l*.

Plums are extensively grown in Texas and pay well. The average acreage from 1888 to 1892 was 2,800 acres, and the average yearly value of the crop about 10,410*l*. In 1892 the acreage was 3,399, and the value of the crop 11,667*l*.

During the five years from 1888 to 1892 the average acreage in gardens all over the State was about 33,000 acres. In 1892 it had risen to 48,211 acres, an increase of nearly 14,000 acres over 1891.

During the same five years the average annual value of the garden crops produced was about 520,833*l*. In 1892 it was 533,760*l*.

While most vegetables and garden fruit pay well, celery, strawberries, blackberries, and cabbages are said to be especially remunerative, and can be all made profitable industries.

ITALIAN MARGARINE LAW.

The Board of Agriculture have received through the Foreign Office a copy of a despatch from Rome enclosing a translation of a new law respecting the conditions under which margarine and butter substitutes may be sold in Italy.

This law, which is dated July 19th, 1894, provides that persons who for commercial purposes keep or sell, or export from, or import into the kingdom of Italy, butter prepared wholly or partly of margarine or of other oily or fatty substances not derived from milk-cream, shall print clearly on each piece of the product either the words *artificial butter* or else the word *margarine*.

They must also indicate in large and clear letters and in the same words the nature of the article on the receptacle, linen, or paper containing it, and the artificial character of the butter, or the composition of the mixture, must be mentioned in the books, bills, letters, and bills of lading.

It is further provided that to the receptacle or wrapper a label must be affixed clearly indicating the artificial character of the article in the above-mentioned words. Shops where products resembling butter are exposed for sale must have a notice outside with the following words in clear characters:—*Margarine, Oleomargarine, Elementary Fat, or Artificial Butter, sold here.*

Makers and sellers of margarine, oleomargarine, artificial butter, or mixtures of oily or fatty substances not derived from milk-cream are forbidden to add any colouring matter to their produce which would tend to make it resemble natural butter.

The penalty for a breach of the preceding regulations is a fine ranging from 8*l.* to 80*l.*, accompanied by confiscation of the goods.

In case of a repetition of the offence an additional punishment may be inflicted of three months' imprisonment and of suspension of the right to carry on the trade for a period varying, according to the circumstances, from ten days to six months.

The Ministry of Agriculture, Industry, and Commerce is empowered to make special regulations to ensure the execution of the present law, and to give the necessary instructions to the communal sanitary officers and to the customs officials.

XV.—PARLIAMENTARY PUBLICATIONS DEALING WITH AGRICULTURE.

Board of Agriculture. Further Papers and Correspondence relating to the Landing in Great Britain from Canada of Cattle affected with Pleuro-Pneumonia, with a copy of a Minute of the Board of Agriculture dated the 13th August, 1894 and Minutes of Evidence and Appendices (C.-7496). Price 8½d.

This volume is in continuation of Parliamentary Papers C.-7123 and C.-7866. It contains a copy of a Minute of the Board of Agriculture dated 13th August 1894, relating the circumstances which determined the Board to institute a special inquiry as to the character of the morbid appearances present in the lungs of certain cattle landed in Great Britain from Canada, and setting forth the conclusions at which the Board have arrived upon a careful review of the evidence and facts before them.

The Board state that it is beyond question that a disease occurs in the lungs of Canadian cattle imported into this country, which, in the opinion of many of the most experienced and best qualified veterinarians in this country, is contagious pleuro-pneumonia, which, even in the opinion of pathologists ready to admit the hypothesis that the disease is new and hitherto unobserved, is a bacterial or germ disease, and which could not have developed to the extent shown on the slaughter of the diseased animals in this country a fortnight or three weeks after shipment, unless it had been originally contracted before leaving Canada. In the view of the Board these matters deserve and will doubtless receive the serious attention of the Canadian Government, and of public and private veterinarians in the Dominion, but in the meantime the duty of the Board is clear. They have no alternative but to act on the assumption that the disease found in the Canadian animals was in fact contagious pleuro-pneumonia, and in view of this fact they must maintain in force the normal security provided by the statute against the introduction of disease by means of imported animals, viz., by their slaughter at their first port of landing.

This volume also contains the Minutes of Evidence (with Appendices), given to the President of the Board of Agriculture, as to the appearances present in the lungs of certain cattle landed in Great Britain from Canada in May and June 1894.

Report by Mr. D. F. Schloss on Profit Sharing. Labour Department, Board of Trade. [C.-7458.] Price 10d.

This report contains information respecting several schemes of profit-sharing in agriculture, which have been promoted by landowners and others in different parts of the country. Among

the systems of this kind described as being in operation at the date of the report is one which was adopted early in 1886 by Earl Spencer on a farm of 296 acres at Harleston.

Lord Spencer provides the requisite capital and appoints a manager, under whom eight labourers (associated as the "Harleston Co-operative Farming Association") and two boys work. He may also determine the connection of any co-operator with the scheme, and may depute the buying and selling of stock and produce to his own nominee. From the gross revenue deductions for outgoings are to be made, including deductions for the rent, rates and taxes, and 4 per cent. interest on the capital employed. Of the net profits, 75 per cent. go to a reserve fund to be accumulated until the whole of any capital advanced by or due to Lord Spencer, with interest, shall have been redeemed, and a surplus of 1,000% realised and maintained; the balance of profits is to be divided annually among the co-operators (including the manager) in proportion to wages earned, but should a loss be made, then, if a balance of profits exists in any subsequent year, this balance is to be carried to a reserve fund until the loss shall have been made good. Canon Bury, the hon. secretary of the association, writes that there has been no opportunity of testing the system of profit-sharing as there have been no profits to share; the continuous fall in prices caused the men to lose heart, and as the whole secret of success lay in the work being done with greater zeal and earnestness, and therefore done cheaper, the scheme may be said to have failed.

A more successful experiment is that which was initiated in 1886 by Mr. Albert Grey, who farms a considerable extent of land in Northumberland. This gentleman is said to have first adopted profit-sharing in the year mentioned in relation to the East Learmouth Farm and to the Howick Home Farm, in 1888 in relation to the farm of Chevington Moor, and in 1889 in relation to West Learmouth Farm. Since May 1891 the two Learmouths have been worked together as one undertaking. The system now in force in regard to the Learmouths is that after the fixed charges of rent and interest (at 4 per cent.) have been met, 25 per cent of the profits is carried to reserve fund, 25 per cent. is allotted to management (of which two-thirds goes to the head manager, and the other one-third is divided equally between the stewards and the head shepherds), while of the remainder one half goes to Mr. Grey, and the other half is divided between the labourers in proportion to the wages earned by each. It is provided that if the gross profits for any one year should fail to pay rent and interest on capital, the deficit must be made good out of the net profits of succeeding years before any bonus can be distributed. The objects to which the reserve fund is to be devoted are (1) to make up the annual charges of rent and interest in bad years; (2) to provide superannuation allowances; (3) to supply money "for any

“ object which seeks to promote the general well-being of the labourers on the farm.”

Both in respect of the Learmouths and of Howick it is stated to be the rule that in the division of the profits account is taken only of labourers hired for the year, and that the share allotted to persons less than two years in Mr. Grey's service is paid into the reserve fund, the receipt of bonus being confined to those who have been at least two years in his employment. The ratio of bonus to wages is reported to have been as follows: The labourers employed at East Learmouth received in 1887-91 inclusive an addition to their wages at the average rate of 4·3 per cent. At West Learmouth (1890-91 inclusive) there was no bonus. Since the amalgamation of these farms in 1891 there has been no bonus. The bonus paid to the labourers at Howick (in 1887-93 inclusive) has averaged 1½ per cent. on their wages. At Chevington Moor no bonus has yet been paid. The total extent of Mr. Grey's profit-sharing farms is 3,765 acres—1,290 permanent pasture, 2,475 arable. There are employed thereon in all 118 hired servants, exclusive of additional labourers engaged temporarily to the number of about 50 each year.

Similar details are given of the systems of profit sharing in operation on farms belonging to Lord Wantage, the Marquis of Hertford, the Hon. T. A. Brassey, and others.

Royal Commission on Agriculture. Minutes of Evidence with Appendices. [C.—7400.—I.] Price 3s. 9d.

This volume contains the evidence of 39 witnesses who were examined by the Royal Commission on Agriculture between the 9th November 1893 and the 16th March 1894. The volume also contains an index to the evidence, and four sets of appendix papers. Appendix A. consists of statements handed in by the witnesses; Appendix B. comprises a series of tables showing the estimated production of cereals and the numbers of live stock in Great Britain, together with a statement of the prices of live meat at the Metropolitan Cattle Market; Appendix C. is a statement showing the rates of Customs duty leviable on imports of grain and flour in different European countries and the United States; Appendix D. is a summary of replies received from the Land Office Inspectors of the Board of Agriculture as to the extent of agricultural depression in their respective districts.

Forty-first Report of the Department of Science and Art of the Committee of Council on Education, with Appendices. [C.—7337.] Price 1s. 9d.

This volume is the annual report dealing with the work of the Department during the year 1893. It contains in an

Appendix a list of the subjects of technical instruction which have been sanctioned since the passing of the Technical Instruction Act, 1889, including the following, which are more or less connected with agriculture :—

Agricultural engineering (including driving and working steam engines and machinery).

Agriculture (practice of) and agricultural processes (including demonstrations and experiments for agricultural instruction; practical farm work; vegetable and fruit growing; fruit storing; market gardening; glass houses; management of live stock; dairy work and cheese-making; thatching; fence and mow-making; sheep shearing; hedging; ditching; rick-making; shepherding; under draining; stacking; ploughing).

Bee keeping; cider and perry making; entomology; farriery; forestry; gardening; horticulture and arboriculture; milling (flour manufacture); poultry keeping; principles of road making; sugar manufacture; veterinary science; and the preparation and treatment of wool.

The Fifth and Final Report of the Royal Commission on Labour. Part I. [C.-7421.] Price 2s.

This report contains a review by Mr. W. C. Little, the senior Assistant Commissioner, of the results of the inquiry which has been made into the condition of the agricultural labourer in different parts of the United Kingdom. In an introductory statement as to the character and scope of the inquiry, it is observed that about 1,200,000 persons were enumerated in the Census of 1891 under the several occupations entered in the category of wage earners in agriculture, of whom less than 70,000 were females. The number of wage earners in agriculture to every 10,000 of total population in 1871, 1881, and 1891 is shown as follows :—

Number of Wage Earners in Agriculture to every 10,000 of Total Population.

	1871.	1881.	1891.
England and Wales - - - -	434	343	275
Scotland - - - -	490	400	300
Ireland - - - -	942	650	595
Great Britain and Ireland - - -	531	394	318

From these figures it is estimated that the rate of decrease in 20 years has been about 20 per cent. in England and Wales, 27 per cent. in Scotland, and 45 per cent. in Ireland. It is

remarked as a noticeable fact that in each of the three countries the decline in the number of female wage earners has been greater than in the case of the males.

Mr. Little then proceeds to summarise the results of the investigations made by the Assistant Commissioners dealing with England, Wales, Scotland, and Ireland in separate sections.

In England it has been found that very generally throughout the 38 districts inquired into, the supply of agricultural labour is fully equal to the demand at any but the busiest times of the year; but the demand is said to have been considerably reduced and economised by changes in the system of farming, by the use of machinery, by the conversion of arable land to grass, and by a lessened expenditure upon neat and trim farming. Farmers, it appears, rely more upon casual labourers for help in the busy seasons, and thus keep their regular staff at the minimum strength required to keep the farms going. The withdrawal of women from agricultural work is stated to be general almost everywhere; but in Northumberland the regular employment of female labour is still usual, nearly one-fourth of the number of wage earners in agriculture in that county being women. There is said to be a decline in the efficiency of the English labourers owing to the migration of the more active and intelligent members of that class.

In none of the eight districts visited in Wales did the Assistant Commissioner find a superabundance of labour; in some localities a decided scarcity is reported. There is also said to be a difficulty in obtaining female labour for dairy and domestic work on farms.

Complaints of an insufficient supply of labour are, it seems, very general in the 14 districts reported upon in Scotland, but the decreased supply has been met by a change in the system of farming and by economy in other directions. The labourers are said to be less willing and less industrious than formerly, but there was no general complaint of their want of skill or capacity.

In Ireland it would appear that concurrently with the general decrease of population there has been a decreased demand for labourers. In 15 out of the 30 districts of inquiry there is stated to be at some period of the year an insufficient supply of agricultural labourers, but in most of these districts there are at times too many labourers for the work to be done. The labourers in Ireland are said to be inferior as compared with those of past days, and this alleged inferiority is attributed to the emigration of the more able and intelligent members of the class. The deterioration in the physique of Irish labourers is by some persons ascribed to modern diet—white bread and tea having very generally replaced oatmeal stirabout and milk.

In respect of wages and earnings, Mr. Little, after a careful investigation of all the evidence on the subject, estimates the average earnings of the ordinary labourer in England at 15s. 11d.

per week with a maximum of 20s. 9d. per week in Glendale, Northumberland, and a minimum of 12s. 6d. per week in Langport, Somerset. The earnings of shepherds are estimated to range from 23s. 6d. in Glendale to 14s. in Langport, and those of carters, cattlemen, and others in charge of stock from 20s. 9d. to 14s. in the same districts. These estimated earnings of ordinary labourers include various allowances in addition to the money wages actually received, and they are those of average men who work regularly and diligently throughout the year. In districts where piece-work is common a first-class labourer can earn considerably more than the estimated sums. Woods and underwoods are said to furnish supplementary employment to agricultural labourers in some districts when farm work is slack. The average money wages of the English labourer based on the 38 estimates of the mean rates for all the districts included in the inquiry are estimated to be 13s. 5d. per week. The average rates of wages as ascertained by the Richmond Commission in 1879–81 was 13s. 1d. per week, while the average rate of weekly wages in 1867–70 is estimated to have been 12s. 3d. a week.

The total earnings of labourers in Wales are reported to range from 14s. to 18s. 6d. per week, including allowances. Indoor servants' wages in the Principality are said to range from 18l. to 36l. per year in addition to board and lodging, while dairy-maids receive wages ranging usually from 11l. to 16l., though in some cases salaries of 28l. or even 30l. a year were paid to dairy-maids. In Wales the average money wage of the ordinary labourer, finding his own food, is estimated to be 14s. 10d. per week. This sum is apparently about 20 per cent. more than the wages prevailing in 1870, but it is below those of 1879.

In the case of Scotland, Mr. Little states that it is not possible to make the wages and earnings of an ordinary labourer the basis of comparison, because in many districts that class is not numerous enough to furnish an estimate. Selecting the earnings of the ordinary married ploughman to gauge those of other classes, except shepherds, he estimates the average weekly earnings of the Scotch labourer to be approximately 18s. 9d., the range being from 13s. 10d. in Orkney and Caithness to nearly 23s. in Lanark. The lowest rate of earnings prevails where the payments are for most part in kind. The payment of shepherds exhibits considerable variety, ranging in districts from 16s. 6d. to 29s. 3d. weekly, but in many districts these earnings are made up partly by the keeping of one or two cows and their followers, and partly by other perquisites, the cash payment being only a small part of the whole. The earnings of the Scotch labourer of the present day are said to be considerably higher than those of 20 years ago.

The annual earnings of ordinary labourers in Ireland are reported to range from 17l. 10s. to 40l. a year, the average of the mean rates of the estimated annual earnings being a fraction

above 26*l.*, or at the rate of 10*s.* a week. The earnings of servants who are boarded (and they form a large per-centage of the total number employed) are estimated to be about 28*l.* 12*s.* a year, including 15*l.* 12*s.* a year for board and lodging and 13*l.* money wages. It seems that the evidence to be derived from statistics of former periods would appear to show that wages have risen, but the amount of increase cannot be determined.

With reference to cottage accommodation, Mr. Little reports that in villages which are owned chiefly or entirely by one landlord, or where cottages form part of the equipment of a landed estate, the cottages are almost invariably superior in character to those in open villages and to those held apart from land, and to those of owners depending to some extent upon cottage rents for their living. In England, generally, a higher style of accommodation is, it seems, required to qualify cottages for commendation than is the case in Scotland, while Wales ranks below the latter country in this respect. In Ireland a still lower average condition is said to prevail. There is evidence, however, that there has been some progress in public opinion in Great Britain as to what are the necessary requirements and the minimum of accommodation which ought to be given, and a comparison of plans and descriptions of houses which were deemed superior 40, 30, or 20 years ago will, it is maintained, show that a considerable advance has been made in this direction. In England and Scotland the improvements which have taken place are stated to be due, in a great measure, to the example which has been set by a number of landowners. In Ireland such improvement as there has been is exhibited in the cottages erected under the Labourers Act, 1883; these are let at rents varying from 8*d.* to 1*s.* 6*d.* a week, only about 12 per cent. being let at more than 1*s.* a week.

Rents of cottages in England are stated to range from 9*d.* to 7*s.* a week, the most usual sum charged being 1*s.* 6*d.* a week. In Wales the rents range from 6*d.* a week to 7*l.* or 8*l.* a year. Throughout Scotland farm cottages, which comprise a very large proportion of those occupied by farm labourers, are let with the farms and held by the occupants rent free.

Summarising the evidence in respect of cottage accommodation, Mr. Little states that the supply of cottages is not now generally deficient, but their distribution is irregular, and their situation often very inconvenient for the inhabitants. The accommodation provided in respect of the number, size, and comfort of the rooms, the sanitary condition and the water supply, is, he considers, lamentably deficient and deserves the gravest consideration with a view to remedial action.

As regards allotments it appears that there is little evidence of an unsatisfied demand in England; labourers complain that allotments are let at a much higher rate than the rent paid by farmers, and it is observed in the report that in many cases the rents of allotments are apparently very high. Allotments are

reported to be unpopular in Wales; potato grounds, however, are to be found everywhere, and gardens are very commonly attached to cottages. In Scotland allotments are said to be unknown and undesired so far as agricultural labourers are concerned; potato grounds are provided in some districts, and the cottages are universally provided with gardens, though these are apparently not generally well cultivated nor much desired. Allotments, as understood in England, scarcely exist in Ireland, but potato grounds are very generally provided.

In 34 districts out of the 38 reported upon in England a large proportion of the labourers, especially the younger men, belong to some benefit society. In three districts of Wales a number of labourers are enrolled as members of friendly societies, but in other districts this does not seem to be the case. Scotch labourers are said to be very generally indifferent to benefit societies, although membership of such societies is common in a few localities. Benefit societies are apparently almost unknown in Ireland.

Trades unions of agricultural labourers were found to exist in only six of the 38 districts of inquiry in England, and there is, it appears, a total absence of any organisation of this nature in Wales. In Scotland the Scottish Ploughman's Federal Union is said to have a considerable number of members, and a few local organisations are mentioned. Some organisations of agricultural labourers exist in different parts of Ireland, but they do not seem to be very generally supported or at all active.

In 13 districts in England the relations between the farmers and the labourers are said to be good or satisfactory, in 17 they are described in some such terms as "fair," "amicable," "not unfriendly," but in eight districts the report is less favourable. In some districts of Wales it is reported that a certain sourness of feeling and an absence of good-will exist, while in another a much better feeling prevails. As regards Scotland it is stated that, while the relations between the two classes are on the whole fairly good, there is evidence of a want of good feeling and sympathy in some parts of the country. The relations are, it appears, most strained where the land is inferior and the farmers are small men, and wherever bad bothies, bad cottages, and proximity to mining villages and manufacturing towns occurred, the relations were anything but cordial. The tenor of most of the reports on Ireland is to the effect that the relations of masters and their labourers are satisfactory and even friendly; there are, however, some exceptions. The chief causes of complaint on the part of the labourers appear to be the want of continuous employment and low wages, while the employers generally complain that the labourers are less industrious and willing than formerly.

With respect to the general condition of the English agricultural labourer, there is, it seems, an almost unanimous opinion that a great improvement has taken place during the last 20

years. Mr. Little says that the most effective agent in bringing about the improved condition has undoubtedly been the cheapness of all the prime necessities of life, and he estimates that 16s. will to-day buy as much of the principal commodities which a labourer consumes, in the proportions in which he requires them, as could have been bought for 20s. in 1871-2. In the opinion of several observers the labourer has also advanced morally; he is said to be more sober, more provident, and less dependent upon charity or poor relief. But, notwithstanding the improvement which has taken place in every part of the country, there are, it is feared, too many of the class who, partly by their own fault and partly by misfortune, are in a chronic state of poverty and distress; but in this respect it is considered that the agricultural labourer will probably compare favourably with those of any other class; and the lot of the least fortunate is in many respects better than that of many dwellers in towns. As regards the future, Mr. Little states that it is hopeless to expect a rise in wages while the prices of produce remain as they are at present. Everything, he says, seems to point to less employment of labour, and unless there be a further reduction in the numbers of the rural population it is difficult to see how they can be employed upon the land. In respect of the condition of the Welsh labourer, it is maintained that, with all the qualifications which can be suggested, there is no doubt that a great advance has been made in the past 20 years. As in the case of England, the housing of the labourer is apparently the most pressing subject for reform. It is pointed out that, if the sanitary authorities are in many cases supine, they are often powerless to compel an improvement without resorting to the extreme measure of closing and demolishing unsanitary dwellings; and the result of such energetic action would in many places make a large number of families homeless. Mr. Little is of opinion that the evidence from Wales strongly supports the suggestion made by the Assistant Commissioners for England, that the medical officer of health should be placed in a position of greater independence, that he should devote his whole time to the work of his office, and that in order to carry out this object, without pressing too heavily upon the ratepayers of the smaller sanitary districts, the area of his duties should be enlarged.

In Scotland the material and moral condition of the labourers is reported to have immensely improved of late years. It is, however, believed that the present race of labourers is less thrifty and less inclined to save than its predecessors. It would appear that, as is the case in England, the cottage accommodation is the principal matter in which something may be done to improve the condition of the Scotch labourer; and Mr. Little agrees with the suggestion that State loans should be made to landlords with the object of promoting the supply of better cottages. He considers it also desirable that the law of master

and servant should be amended to enable either party to obtain, by a process of summary jurisdiction, damages for a wilful breach of contract.

A great improvement is said to have taken place in the general condition of labourers in Ireland in recent years, but in the majority of the districts of inquiry their condition is reported to be far from satisfactory, and the sanitary condition of the labourers and small holders' cottages is by universal testimony deplorable.

In conclusion, Mr. Little makes the following deduction from the evidence at his disposal :—

- “ 1. The number of those competing for employment in agriculture has everywhere decreased.
- “ 2. The decrease in the number of wage earners in agriculture has been most marked in Ireland; but the effect of a decrease has been most felt in Scotland, where only there is a general complaint of a scarcity of labourers.
- “ 3. In England a general contraction of employment in agriculture has proceeded concurrently with the decrease of wage earners, and to some extent balanced the supply and demand.
- “ 4. The decrease in the number of labourers has improved the chance of obtaining regular work by those who desire it.
- “ 5. The universal withdrawal of women from field work is an evidence of an improvement in the circumstances of the labourers.
- “ 6. The material condition of the labourers has everywhere improved, though there are still very wide and striking differences as to the amount of remuneration received by them in different localities and parts of the United Kingdom.
- “ 7. This improvement, though in some measure due to an increase of earnings, is, however, very largely the result of the cheapening of commodities which are the necessities of life.
- “ 8. The least satisfactory circumstance affecting the life of the labourers is the condition of the dwellings in which a considerable number of them are compelled to live.”

Royal Commission on Labour: The Agricultural Labourer, Miscellaneous Memoranda, Abstracts, and Statistical Tables, by Mr. William C. Little, Senior Assistant Agricultural Commissioner. [C.—6894—XXIV.] Price 4s.

This Appendix to Mr. Little's Report on the Agricultural Labourer is divided into three sections, the first of which deals with England and Wales and occupies about half the present Appendix, while the second refers to Scotland, and the last to

Ireland. The details are arranged in chronological order from 1862, the date of "The Children's Employment Commission." That Commission was confined to England and Wales. It was followed in 1867 by "The Commission on the Employment of Children, Young Persons, and Women in Agriculture." The Reports of these two Commissions form the subject of a detailed Memorandum dealing with the extent to which women and children were employed in agriculture, systems of hiring, period of engagement, hours of work, wages and earnings, housing of the agricultural labourer, allotments, gardens, and benefit societies. The Memorandum is accompanied by Appendices, giving (1) statistical tables showing the number, sex, age, etc. of agricultural labourers; (2) rents and accommodation; (3) labourers' expenditures; (4) females employed in agriculture—their number, nature of work, wages; (5) allotments and gardens; (6) hiring and period of engagement; (7) hours of work in different counties; (8) wages and earnings of agricultural labourers in different counties.

The condition of the agricultural labourer, as shown by the Reports and Minutes of Evidence of the Royal Commission on Agricultural Interests, 1879–1882 (the Richmond Commission), is set forth in similar detail. A third Memorandum deals in detail with the census returns of 1871, 1881, and 1891, so far as they bear upon agriculture. Tables are elaborated, showing the numbers of "wage-earners" and "agriculturists," their percentage, class, sex, age, and ratio to population and area, in the different registration and agricultural divisions in the years mentioned.

The section of the volume dealing with England and Wales is terminated by a return by the Board of Agriculture showing the cultivated area, the acreage under certain crops, and the number of sheep and cattle in registration sub-districts and districts of inquiry in 1891, followed by a summary statement showing for the several districts of inquiry the area under certain crops, the number of cattle and sheep thereon, and the ratio of these to the cultivated area, and concluding with three tables in which the several districts are arranged in order in respect of the relative importance of certain crops and descriptions of stock to the cultivated area. The first table gives separately the proportion of arable land, white corn, cattle, and sheep, per 100 acres of cultivated land. The second table deals similarly with wheat, barley, oats, and roots, and the third with cows, heifers, and other cattle. This terminates the portion of the Appendix devoted to England and Wales.

Section II. is devoted to Scotland, and contains four Memoranda. The first deals with the Report of the Royal Commission on the Employment of Children, Young Persons, and Women in Agriculture, 1867. The second Memorandum, with Appendices, deals with the Reports of the Richmond Commission, 1879–1882, and refers to the condition of the agricultural labourer, supply

of labour, employment of women and children, hiring, period of engagement, hours of labour, wages, housing of the labourer, gardens, allotments, cows and sheep owned by labourers, and friendly and benefit societies. The third Memorandum refers to the census returns of 1871, 1881, 1891, and the fourth and last Memorandum deals with the agricultural returns for Scotland, 1891, in a similar manner to that adopted in the case of England and Wales.

To Ireland six Memoranda are devoted, the first dealing with the reports from Poor Law Inspectors on the wages of agricultural labourers in Ireland, 1870; the second with the Reports of the Richmond Commission, 1879–1882; the third with the Bessborough Commission of Inquiry into the working of the Landlord and Tenant (Ireland) Act, 1870, 1880–81. This is followed by an abstract of evidence contained in the Report and Proceedings of the Royal Commission on the Land Acts (Ireland) (the Cowper Commission), 1886. The fourth Memorandum deals with the Labourers (Ireland) Acts, 1883, 1885, 1886, 1891, 1892, with reports communicated by the Local Government Board of Ireland, and extracts from evidence given before a Select Committee of the House of Commons in 1884. The fifth Memorandum deals with the census returns of 1871, 1881, 1891; and the sixth and last with the agricultural statistics for Ireland, 1891.

The Annual Local Taxation Returns (England) for the Year 1892–93. Part I. [H.C. 198.] Price 11½d.

This volume consists of two parts. The first part is the Poor Rate Return for the year ended Lady Day 1893, while the second part consists of a return relating to the valuation of property for the poor rate in 1891 and 1892.

Part I. of the Poor Rate Return gives a summary, as regards each union-county and division, of the amount of the poor rates levied during the year, and the amounts received by boards of guardians from county and borough councils under the provisions of the Local Government Act, 1888, and from other sources (except from loans) in aid of such rates; and also the amounts expended therefrom for the relief of the poor and purposes connected, or partly connected, therewith, and for other purposes.

It also gives separately the amounts received, expended, and outstanding in respect of loans raised by boards of guardians.

Part II. is a Comparative Statement of the Expenditure on Relief to the Poor in the years ended Lady Day 1892 and 1893.

Part III. gives details of all the receipts and expenditure shown in Part I., exclusive of loans, with regard to each of the 648 unions and parishes under separate boards of guardians in England and Wales, and the Scilly Isles. Part IV. of the return is devoted to the loan transactions of boards of guardians, the

amount raised by means of loans, and the expenditure defrayed out of loans, during the year, together with the amounts of the loans owing by the guardians at the end of the year.

It appears from the return that the total amount of poor rates raised during the year for all purposes, including the sums contributed by Government in lieu of poor rates, was 16,531,406*l*. This amount was greater than the amount raised during the preceding year by 889,386*l*.

A statement is also given which has been prepared with the view of showing what was the rate per head on the estimated population of the metropolis, and of each union-county of the receipts from poor rates, and of the gross expenditure on relief to the poor, and the rate in the £ on rateable value of the receipts from poor rates. The union-counties have been arranged according to the amount of the rate per head on estimated population which the gross expenditure on relief represented.

It shows that the relative rates per head on the total receipts from poor rates, and on the gross expenditure for relief, varied greatly in different union-counties, and that in some cases the rate per head for relief was considerably less than half the rate per head of the rates raised, whilst in Bucks, Berks, Westmorland, and Nottingham, the rate per head of relief represented about three-fourths of the rate per head of the rates raised. The highest rate per head of the poor rates raised was in London, where it amounted to 21*s*. 3¼*d*. per head; the lowest was in Nottingham, where it amounted to only 5*s*. 11½*d*. per head.

The highest rate per head for expenditure on poor relief was 12*s*. 9½*d*. in London, and the lowest 3*s*. 10*d*. in the West Riding of Yorkshire. The rate in the £ on rateable value of the poor rates raised also varied considerably in the different union-counties. In the metropolis and 17 other union-counties it was 2*s*., or more than 2*s*. in the £, whilst in Westmorland it was only 9*d*. in the £. It is also observed that there were considerable differences in the several union-counties between the proportions which the rate per head on the estimated population bore to the rate in the £ on the rateable value of the amounts raised from poor rates.

Second Report from the Select Committee of the House of Lords on Marking of Foreign and Colonial Produce. [H.C. 293.] Price 11*d*.

This publication is the second report by the Select Committee appointed to consider and report whether legislation for the purpose of requiring the foreign or colonial origin of imported agricultural and horticultural produce, and especially meat, cheese, and fruit, to be marked thereon, or otherwise indicated, is necessary, expedient, and feasible; and, if so, what are the provisions which such legislation should comprise.

In this report the Committee state that, having considered and reported during the last session on the subject of the marking of foreign meat, they have confined their inquiry during the present session to imported agricultural and horticultural produce other than meat.

The subjects dealt with in the present report are fruit, cheese, butter and margarine, milk, eggs, and hay.

In the case of fruit it was shown that much misrepresentation is carried on by the sale of foreign fruit under the name of English, and it was also stated before the Committee that it is customary for the agents of jam manufacturers in many cases to supply baskets to the fruit growers whether at home or abroad, and to mark them with their own name or initials. On arrival in the market there is nothing to distinguish between such baskets containing foreign fruit and those containing English.

The Committee are of opinion that where the mark on a package, though only that of the owner or addressee, can be shown to the satisfaction of the Commissioners of Customs in effect to be misleading to purchasers, the Commissioners should frame an order for the detention of such packages.

With a view to prevent the use of unsound fruit, the Committee suggest that there should be an efficient inspection at the ports, and in the factories, of fruit arriving in closed casks.

It was suggested to the Committee that cheese might easily be marked at the time it was in the press without diminishing its value, while it would be impossible to make these impressions after the cheese left the press.

The Committee have not thought it their duty to make any special inquiry into the subject of margarine, but they desire to call attention to a proposal that all margarine should be sold without colouring matter, the effect of which would be that margarine would retain its natural white colour, while butter would be of various shades of yellow.

As regards milk, it is remarked that until recently the competition of imported milk with that produced in England was very limited in extent, but since last year it has increased considerably. It was pointed out to the Committee that, whereas milk produced in England is subject to safeguards for the protection of the public health by the inspection of dairies and milk shops, in the case of milk imported from abroad no safeguards exist other than those required by the laws of the respective countries of export, and there is no means of testing it after landing. The suggestion was made that a yellow colour imparted to milk imported from abroad would prevent the possibility of confusion, but it was not denied that such a requirement might prejudice the sale of imported milk.

It is stated in the report that there does not appear to be any practical difficulty in the way of marking eggs. Many firms do so already as a guarantee of freshness. The mark, it is stated,

soaks into the shell and becomes indelible, while one person could mark many thousands in a day.

There is no reason, it appears, to suppose that any misrepresentation exists in the trade in forage.

The Committee are of opinion that the competition between English and foreign fruit, though severe, is not, except in so far as wilful misrepresentation is carried on, on the whole, unfair.

The Committee believe that a vigorous application of the powers conferred on the Board of Agriculture by the Merchandise Marks (Prosecutions) Act just passed will be sufficient to check this misrepresentation, but they desire to point out that it may not be possible for the action of a Government department in this direction to be sufficiently far-reaching. If the working of the Act should not be found to attain the object desired, it is a question whether powers might not be conferred by Parliament on county and borough authorities to conduct these prosecutions, the cost of which might be defrayed out of the rates.

The conclusions and recommendations of the Committee are to the effect that increased vigilance might with advantage be used by inspectors under the Public Health Acts, especially in Scotland, to see that fruit imported by manufacturers of jam is in sound condition and fit for consumption before it is made into jam, but they do not think that legislative powers are needed in addition to those conferred by the Public Health (England and Wales) Act, 1875, and the Public Health (Scotland) Act, 1867. The Committee are further of opinion that it would conduce to their own as well as to the general interest, if traders and manufacturers would make themselves more fully acquainted with the remedies under the existing law than they appear to be at present.

The Committee have no doubt that the compulsory marking of packages in which fruit is imported is feasible, but they are not satisfied that the results to be obtained would justify the trouble and expense which would be entailed on the importer, while the marking of every parcel of fruit in the hands of the retailer would be impossible.

The proposal to compel English manufacturers to mark their jam-pots differs from the proposal to exclude goods arriving at the ports without marks, and could not in the opinion of the Committee be satisfactorily enforced.

The Committee are of opinion that there are some imported articles of agricultural and horticultural produce, such, for example, as eggs, which could be marked, and that such marking would render difficult the present fraudulent practice, which appears to be widespread, of selling foreign goods as English, with the further result of stimulating the British agriculturist to produce articles of the freshness and origin of which purchasers would then be assured.

They consider that the subject of the compulsory marking of imported goods is deserving of careful consideration by Parlia-

ment, with a view to ascertain how far it may be possible and desirable to impose those conditions on such goods as are clearly capable of being marked. The danger to health in admitting to consumption milk from dairies over the sanitary condition of which there is in England no control, and the substitution of other articles for butter and cheese, are reasons, in addition to the protection of the consumer from fraud and the encouragement of the depressed industry of agriculture, which lead the Committee to give expression to this opinion.

Report from the Select Committee of the House of Commons on Food Products Adulteration ; with the Proceedings of the Committee. Price 1d. [H.C. 253.]

The Committee state, in their report dated August 1st, that at this late period of the session it is not in their power to conclude their inquiry. They have therefore agreed to report to the House of Commons the evidence already taken, and to recommend that a Committee on the same subject be appointed in the next session of Parliament.

First Report of the Royal Commission on Land in Wales and Monmouthshire. [C.—7439.] Price 6d.

A Royal Commission was appointed on the 1st April 1893 “to inquire into the conditions and circumstances under which land in Wales and Monmouthshire is held, occupied, and cultivated.”

In their first report, dated 29th June 1894, the Commissioners submit the minutes of evidence taken between 23rd May 1893 and 17th March 1894. They propose to submit additional minutes of evidence, and to leave any recommendations which they may consider it their duty to make, to be submitted to Her Majesty, in a further or final report at a future date.

Fifth Report of H.M. Commissioners appointed to carry out a Scheme of Colonisation in the Dominion of Canada of Crofters and Cottars from the Western Highlands and Islands of Scotland, and from the Congested Districts of Ireland. [C.—7445.] Price 1½d.

This publication contains information relating to the position of the settlements in 1893, and showing the acreage under various crops, as well as the live stock on the farms. No colonisation has yet been undertaken by the Board from the congested districts of Ireland.

Report of the Irish Land Commissioners for the period from the 1st April 1893 to 31st March 1894. [C.—7380.] Price 1s. 6d.

In this volume it is stated that the collection and publication of the prevailing prices of agricultural produce has been continued by the Agricultural Department of the Irish Land Commission.

Diagrams showing the fluctuations of prices of beef, mutton, store stock, and agricultural produce in Ireland are included in the Appendix.

The Agricultural Department has continued to carry out the working of the scheme approved by the Congested Districts Board for improvement in the breeding of cattle, horses, asses, swine, sheep, and poultry; and also for the improvement of agriculture and forestry; the Department has also, at the request of the Congested Districts Board, purchased small quantities of seeds and manures for sale and distribution to residents in congested districts.

The 60th Report of the Commissioners of National Education in Ireland. [C.—7457.] Price 4d.

The information contained in this volume as regards agricultural education shows that during the year 1893 there were 79,462 pupils examined in the Agricultural Class Books in Ireland, of whom 48,399 passed. Instruction in the *theory* of agriculture is compulsory in all rural schools in Ireland for boys in the 4th, 5th, and 6th classes, and is optional in the case of girls.

The total number of School Farms in connection with Ordinary National Schools on the 31st December 1893 was 45, and there were 30 other schools having School Gardens attached.

The Report states that the instruction given in the Dairy Schools at Glasnevin and Cork continues to be efficiently carried out. The number of dairy pupils who attended during the two sessions of 1893 at the Glasnevin Dairy School was 60.

During the winter of 1893 a special class for instructing persons engaged in creamery occupations as creamery managers was held at the Munster Dairy School. The Dairy School was supplied with the newest machinery suitable for creameries, and special instruction was given in the use of the machinery. Lectures on the chemistry of milk were delivered by a skilled chemist. Practical instruction in creamery management was imparted by an experienced dairy instructor, who at the suggestion, and under the authority of the Government, was appointed from the 1st April 1893 to visit and organise the creameries and butter factories throughout Ireland, and also to give general instruction in buttermaking and cheesemaking to the students of the model farms.

The reports of the Dairy Instructor show that in several instances much remains to be done to remedy existing defects, especially in the drainage, ventilation, and general cleanliness, of the creameries.

The Commissioners state that, although they have no power of control or interference in regard to the management or arrangements of creameries, the visits of the Dairy Instructor have been well received by the managers, and they feel assured that his suggestions for the removal of defects and the adoption of satisfactory methods will prove of practical value in aiding and encouraging the industry.

Three young women were appointed to travel to various centres and give demonstrations in dairying, and the results have proved highly satisfactory. The female Dairy Instructors were well received in the localities which they visited, and a widespread interest was shown in their methods and demonstrations.

During the year, at the request of the Bee-keepers' Association, bee-keeping was sanctioned as a branch of cottage industry in connection with National Schools having farms, school gardens, or dairies attached.

In 23 agricultural schools payments were made to the pupils of the industrial classes for working on the small farms or gardens under the direction of the teachers.

Directory, with Regulations for establishing and conducting Science and Art Schools and Classes. [C.—7408.] Price 6d.

This Directory is revised to June 1894. It contains the syllabus, which has been recast, of the principles of agriculture in which examinations are held by the Science and Art Department. In consequence of the large amount of new matter introduced into the syllabus, it is mentioned that the optional subjects are for the present omitted. Copies of the syllabus can be obtained at 1*d.* each, or 6*d.* a dozen, on application to Messrs. Eyre and Spottiswoode, Queen's Printers, East Harding Street, E.C.

XVI.—IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCE IN THE SIX MONTHS ENDED JUNE 30TH, 1893 AND 1894.

I.—IMPORTS OF CATTLE AND SHEEP.

Countries from which exported.	Cattle.		Sheep.	
	26 Weeks ended July 1, 1893.	26 Weeks ended June 30, 1894.	26 Weeks ended July 1, 1893.	26 Weeks ended June 30, 1894.
	No.	No.	No.	No.
United States - - -	117,661	207,975	—	83,179
Canada - - -	26,228	23,334	101	9,670
Argentine Republic - - -	3,691	6,662	11,555	39,492
Channel Islands - - -	587	741	—	—
Chili - - -	—	—	694	—
	148,167	238,712	12,350	132,341

The above figures, which have been compiled from Returns furnished weekly by H.M. Customs, show an increase in the importation of cattle of over 90,000 head in the first six months of the current year as compared with the imports of the same period in 1893. Nearly the whole of the increase is accounted for by the larger supplies from the United States, which furnished about nine-tenths of the live cattle received in the first half of 1894. This increase, however, fails to replace the total at the figure at which it stood in 1892, when 248,000 head of cattle were imported in the first six months of the year. The receipts from the Argentine Republic exceeded those of 1893 by 3,000 head.

The table shows a largely increased importation of sheep from the United States. The number of sheep received from that source in the six months—viz., 83,179—was considerably in excess of the imports of any previous 12 months since 1883, the largest importation since the year mentioned, having been in 1889, when 18,691 head of sheep were shipped to this country from the United States. The other countries which helped to make up the increase of 120,000 head in the supply of sheep were Canada and the Argentine Republic, the imports from Canada having exceeded those of the first six months of 1893 by some 9,500 head, while the receipts from the Argentine Republic were 39,492 head, or more than treble those of the same period of 1893.

Only nine head of swine were imported in the half year ended June 30th, 1894, and these came from the Argentine Republic.

II.—IMPORTS OF HAY AND STRAW.

The imports of hay and straw in the half years contrasted, as recorded by the Customs, are shown below, distinguishing the countries from which the supplies came.

Countries whence exported.	Hay.		Straw.	
	1893.	1894.	1893.	1894.
	Tons.	Tons.	Tons.	Tons.
Algeria - - - -	730	453	334	—
Argentine Republic - -	3,616	606	—	—
Belgium - - - -	572	1,986	94	1,195
Canada - - - -	4,952	13,208	4	—
Channel Islands - - -	—	—	—	2
Chile - - - -	—	4,002	3	—
Cape of Good Hope - -	—	1	—	—
Denmark - - - -	2,190	3,545	2,949	1,905
Egypt - - - -	—	—	—	8
France - - - -	647	2,324	2,111	2,019
Germany - - - -	814	1,675	5,781	1,872
Holland - - - -	11,972	9,067	7,555	17,074
Italy - - - -	—	125	—	—
Newfoundland - - -	—	23	—	—
New Zealand - - - -	—	22	—	—
Norway - - - -	438	2,433	2	274
Russia, North - - -	314	25,971	—	624
„ South - - - -	—	997	—	511
Spain - - - -	—	364	—	—
Sweden - - - -	142	—	—	5
Tripoli - - - -	—	3	—	—
Turkey, European - -	—	476	—	—
„ Asiatic - - - -	—	542	—	—
United States - - -	36,351	116,912	401	412
Total - - - -	62,738	184,735	19,234	25,901

The imports of hay were 120,000 tons in excess of the receipts of this article in the corresponding period of the previous year, but they are about 16,000 tons less than the quantity imported in the six months ended December last; the total weight of hay received in this country in the year 1893 was 263,050 tons. The receipts of straw in the first six months of 1894 were only about 1,400 tons short of the total quantity imported in the previous twelve months, but in 1892 nearly 70,000 tons of straw were imported.

The quantity of hay imported into the United Kingdom in the month of July last was 14,949 tons, as compared with an importation of 18,664 tons in the corresponding month of the previous year. The receipts from Canada were nearly 100 per cent. below those recorded for July 1893, the entries being 3,772 tons, as against 6,781 tons; while the shipments from

Russia and Holland were 900 tons and 1,000 tons respectively below the imports of hay from these countries in July 1893—the actual receipts in July last being 938 tons from Russia and 832 tons from Holland, compared with 1,878 tons and 1,849 tons respectively in the corresponding month of 1893.

III.—IMPORTS OF HORSES.

The importation of horses is shown in the table below. The figures for this table and the remaining tables of imports have been taken from the monthly Trade and Navigation Returns:—

Horses.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	No.	No.	£	£
Stallions - - - -	231	218	59,379	14,208
Mares - - - -	1,040	1,733	28,520	40,013
Geldings - - - -	5,544	8,478	134,918	199,430
Total - - - -	6,815	10,429	222,817	253,651

The only noteworthy change in the importation of horses was an increase in the supply of geldings amounting to nearly 3,000 animals.

IV.—IMPORTS OF FRESH MEAT.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Beef - - - -	913,786	1,047,497	1,946,302	2,174,564
Mutton - - - -	1,024,311	1,034,507	2,037,524	2,068,600
Pork - - - -	87,546	77,972	216,138	190,446
Rabbits - - - -	33,656	40,770	94,037	112,072
Total - - - -	2,059,299	2,200,746	4,294,001	4,545,682

The imports of fresh meat in the first six months of the present year only slightly exceeded those of the corresponding period last year. Beef was imported from the United States to the extent of 914,000 cwts., as against 772,000 cwts. in 1893. The receipts of mutton from Australia and New Zealand were only 3,337 cwts. in excess of the 649,282 cwts. received from those colonies in the first six months of 1893. Compared with the corresponding six months of 1893, the returns of the imports of pork exhibit a decline of 10,000 cwts., while those of rabbits show an increase of over 7,000 cwts.

V.—IMPORTS OF MEAT SALTED AND PRESERVED.

The quantities and values of salted and preserved meat imported in the six months ended June 1893 and 1894 respectively are shown in the following table:—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Salted beef - - -	93,842	125,641	123,418	189,898
„ pork - - -	77,428	112,072	125,844	184,274
Bacon - - -	1,444,798	1,832,235	3,825,441	4,041,107
Hams - - -	437,067	551,898	1,331,453	1,311,591
Meat, preserved, otherwise than by salting (chiefly canned).	271,732	243,329	699,033	689,012
Meat, unenumerated, salted or fresh.	101,515	101,409	230,914	224,585
Total - - -	2,426,382	2,966,584	6,336,103	6,640,467

The above returns show an increase of nearly 400,000 cwts. in the receipts of bacon, and this is chiefly made up by larger supplies from the United States. It is to be remembered, however, that the imports of 1893, with which the comparison is made, were unusually small, and that the receipts of the first half of 1894 are still nearly nine per cent. under those of the first half of 1892.

VI.—IMPORTS OF DAIRY PRODUCE, EGGS, AND LARD.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Butter - - -	1,208,204	1,342,018	6,540,249	7,183,332
Margarine - - -	629,242	602,049	1,817,184	1,647,712
Cheese - - -	629,958	744,359	1,597,610	1,871,082
Lard - - -	558,761	723,644	1,485,693	1,456,864
Condensed milk - - -	228,991	279,273	465,222	569,027
	Great	Great		
	Hundreds.	Hundreds.		
Eggs - - -	5,174,149	6,163,051	1,901,317	1,948,771

There was a slight augmentation in the imports of butter, and from the following table it will be seen that Denmark increased her shipments of that article to this country by nearly 80,000 cwts. compared with the similar period in 1893. With respect to the increase of 120,000 cwts. entered from “other countries,” it may be observed that this was principally

due to the shipments from Australia and New Zealand, which were more than double those of the first six months of 1893, the figures being 207,000 cwts., as compared with 100,000 cwts. There was also an increase in the supply of butter from Northern Russia, the quantity imported from this source having been 38,000 cwts., as against 21,000 cwts. in 1893.

BUTTER.

Countries.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
From Denmark - - -	479,231	554,048	2,635,300	3,037,825
„ France - - -	246,979	192,235	1,407,953	1,109,954
„ Sweden - - -	140,140	131,216	766,474	718,085
„ other countries - -	341,854	464,519	1,730,522	2,317,468
Total - - -	1,208,204	1,342,018	6,540,249	7,183,332

The countries from which the bulk of the cheese was imported are distinguished below.

CHEESE.

Countries.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
From United States - -	312,777	349,592	767,411	867,485
„ Canada - - -	120,073	175,742	294,219	432,001
„ Holland - - -	122,747	130,253	308,221	331,858
„ other countries - -	74,361	88,772	207,759	239,738
Total - - -	629,958	744,359	1,597,610	1,871,082

The following table shows the principal countries from which the eggs were obtained in the half year. It will be seen that eggs were imported from Germany in much larger quantities in the first six months of the current year than in the corresponding period of 1893, the actual figures having been 1,857,439 great hundreds as compared with 895,995 great hundreds. Belgium also increased her shipments of eggs to this country by over 75 per cent. in this period, the numbers received for the six months ended June 1894 having been 1,627,932 great hundreds, or 720,000 great hundreds in excess of her supply in the same period last year. The importation of French eggs showed a decline of over 40 per cent., or from 2,277,000 great hundreds to 1,355,000 great hundreds. On the other hand, the supply of eggs from Russia exceeded that of the corresponding six months of last year by about 100,000 great hundreds.

EGGS.

Countries.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Great Hundreds.	Great Hundreds.	£	£
From Germany - - -	895,995	1,857,439	266,079	531,299
„ Belgium - - -	907,947	1,627,932	324,413	489,615
„ France - - -	2,276,963	1,354,997	983,209	545,334
„ other countries - - -	1,093,244	1,322,683	327,616	382,523
Total - - -	5,174,149	6,163,051	1,901,317	1,948,771

VII.—IMPORTS OF GRAIN AND FLOUR.

The striking feature in the half-year's supplies of grain and flour is the great increase in barley, the imports of the six months ended June 30th last being more than double those of the corresponding period last year. Wheat, maize, and oats were also received in larger quantities than in 1893, while the imports of wheat flour declined, as will be seen from the table below.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Wheat - - -	27,534,927	32,173,191	9,170,827	9,005,306
Wheat meal and flour - -	9,683,349	9,225,934	4,740,688	4,010,498
Barley - - -	6,434,365	14,261,355	1,735,172	3,344,699
Oats - - -	5,812,257	6,183,109	1,808,406	1,712,889
Peas - - -	937,362	1,005,186	300,032	286,454
Beans - - -	1,823,653	2,764,343	515,956	726,588
Maize - - -	16,007,923	20,809,683	3,871,075	4,635,014
Other kinds of corn and meal.	—	—	248,116	237,868
Total - - -	—	—	22,390,272	23,959,316

Of the countries whence the supplies of wheat and wheat-flour came, the most important in respect of quantities supplied are distinguished in the following table. It will be seen that the receipts of wheat in grain from the United States were nearly 4,000,000 cwts. below those of the first six months of 1893, but this decline was more than made up by the larger entries of grain from Russia.

WHEAT AND WHEAT MEAL AND FLOUR.

Countries.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Wheat :—				
From United States -	17,211,327	13,217,044	5,768,910	3,837,969
„ Russia -	3,064,445	7,526,194	989,952	2,058,668
„ Argentine Republic.	3,240,375	5,539,954	1,042,283	1,462,379
„ British East Indies.	1,522,960	2,482,771	517,806	695,692
Wheat meal and flour :—				
From United States -	8,967,797	8,261,616	4,285,988	3,511,482
„ Austrian Territories.	529,154	528,033	359,472	328,480
„ other countries -	186,398	436,285	95,228	170,536

VIII.—IMPORTS OF VEGETABLES, HOPS, AND FRUIT.

The imports of vegetables, hops, and fruit in the six months ended June last, and in the corresponding period of 1893, are shown in the following table :—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Bushels.	Bushels.	£	£
Vegetables :—				
Onions - - - -	1,882,904	2,394,950	351,454	376,021
	Cwts.	Cwts.		
Potatoes - - - -	2,340,615	1,701,409	804,015	755,131
Unenumerated - - -	—	—	539,888	479,977
Total - - - -	—	—	1,695,357	1,611,129
	Cwts.	Cwts.		
Hops - - - -	74,022	62,409	411,629	351,617
	Bushels.	Bushels.		
Fruit :—				
Apples - - - -	1,125,364	875,088	343,935	272,014
Oranges - - - -	2,778,432	4,681,247	860,894	1,280,555
Lemons - - - -	633,192	735,351	178,622	202,087
Cherries - - - -	288,347	210,346	176,201	141,137
Plums - - - -	29,205	4,715	27,440	4,736
Pears - - - -	10,992	13,696	7,013	6,350
Grapes - - - -	13,393	9,333	24,463	16,260
Unenumerated - - -	424,754	407,810	221,287	250,913
Total - - - -	5,303,679	6,937,586	1,839,855	2,174,052

Of the 62,000 cwts. of hops received in the first six months of this year, over 51,000 cwts. came from the United States, and of the remainder nearly 7,000 cwts. were shipped from Belgium.

The chief feature in the figures of imports of raw fruit is the decreased supply of apples. Imports of cherries, grapes, and particularly plums were inferior to those recorded in the half year ended June 1893. There was, however, a remarkable increase in the importation of oranges.

IX.—IMPORTS OF FLAX, HEMP, JUTE, AND SEEDS.

The imports of flax seed in the first six months of 1894 exceeded the receipts of the same period last year by nearly 50 per cent.; the imports of rape seed were also largely in excess of the quantities imported in the six months ended June 1893.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Tons.	Tons.	£	£
Flax - - - -	47,845	45,266	1,672,930	1,646,911
Hemp - - - -	40,537	43,610	1,071,974	995,413
Jute - - - -	164,636	180,742	1,994,011	2,752,689
Total - - - -	253,018	269,618	4,738,915	5,395,013
	Cwts.	Cwts.		
Seeds :—				
Clover and grass - - -	182,968	196,945	456,764	498,336
	Qrs.	Qrs.		
Flax and linseed - - -	663,600	906,355	1,337,017	1,760,983
Rape - - - -	93,234	148,014	151,139	162,714
Total - - - -	—	—	1,944,920	2,422,033

X.—IMPORTS OF WOOL (SHEEP AND LAMBS).

There was a decline in the importation of South African wool in the half year as compared with the imports of the corresponding period of last year, but this was more than met by an increased supply from Australasia.

	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Lbs.	Lbs.	£	£
From Australasia -	357,343,515	396,488,930	13,202,413	14,274,018
„ Countries in Europe.	24,365,047	14,386,217	898,304	613,457
„ British Possessions in South Africa.	60,679,738	48,163,861	2,291,122	1,872,339
„ British East Indies	16,458,841	19,654,599	484,934	552,202
„ other countries -	16,758,886	19,738,181	507,640	529,623
Total - - - -	475,606,027	498,431,788	17,384,413	17,841,639

XI.—IMPORTS OF HIDES, WOOD, AND TIMBER.

The quantities of dry and wet raw hides, and of timber, imported in the six months are shown in the following table :—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
Hides, raw, and pieces thereof :—	Cwts.	Cwts.	£	£
Dry - - - - -	188,421	248,992	493,545	583,005
Wet - - - - -	222,682	269,818	473,735	543,228
Total - - -	411,103	518,810	967,280	1,126,233
Wood and Timber :—	Loads.	Loads.	£	£
Hewn - - - - -	869,324	1,035,484	1,542,664	1,773,618
Sawn or split, planed or dressed	1,068,389	1,647,619	2,388,177	3,709,935
Staves of all dimensions - -	35,884	57,075	205,613	253,078
Total - - -	1,973,597	2,740,178	4,136,454	5,736,631

EXPORTS.

The figures given in the following statements of Exports of Agricultural Produce have been extracted from the Trade and Navigation Returns, with the exception of those relating to the exports of cattle, sheep, and swine, which have been furnished by H.M. Customs.

The exports of British and Irish dairy produce, and of hops, for the first six months of the current year and for the corresponding period of 1893 are shown below :—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
Butter - - - - -	Cwts. 6,215	Cwts. 7,771	£ 35,693	£ 45,308
Cheese - - - - -	4,150	3,859	16,357	15,193
Hops - - - - -	2,319	5,937	15,688	39,166

EXPORTS OF WOOL.

The exports of sheep- and lambs'-wool in the first six months of 1894 were over fifty per cent. inferior to those of the corresponding period in the previous year, the chief decline being in the shipments to the United States. The following table

shows the exports of this staple, distinguishing the individual countries to which the largest shipments were made.

Countries to which exported.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Lbs.	Lbs.	£	£
Wool, sheep and lambs' :—				
To Germany - - -	1,685,100	742,300	81,595	34,453
„ Holland - - -	560,800	515,200	23,955	21,880
„ Belgium - - -	371,000	253,600	16,541	11,758
„ France - - -	674,400	513,200	30,225	22,608
„ United States - -	5,813,100	1,567,100	183,809	38,239
„ British North America -	165,800	91,600	7,327	4,128
„ other countries - -	579,400	755,500	34,042	41,689
Total - - -	9,849,600	4,438,500	377,494	174,755

EXPORTS OF HORSES.

As regards the exports of horses it will be observed that there was a large increase in the exports of geldings in the first six months of this year as compared with the corresponding period of 1893.

Description.	Numbers.		Values.	
	1893.	1894.	1893.	1894.
	No.	No.	£	£
Stallions - - - -	231	196	32,134	11,848
Mares - - - -	1,467	1,474	71,297	64,177
Geldings - - - -	3,776	5,313	110,687	121,958
Total - - - -	5,474	6,983	214,118	197,983

EXPORTS OF CATTLE, SHEEP, AND SWINE.

The numbers and values of cattle, sheep, and swine of British and Irish production exported from the United Kingdom in the half years under review are returned by H.M. Customs as under :—

Description.	Numbers.		Values.	
	1893.	1894.	1893.	1894.
	No.	No.	£	£
Bulls, oxen, cows, and calves -	1,203	1,252	24,024	25,880
Sheep and lambs - - - -	2,653	1,082	17,998	10,535
Swine - - - -	169	336	1,047	1,604

XVII.—AGRICULTURAL RETURNS OF GREAT BRITAIN, 1894.

I.—PRELIMINARY STATEMENT compiled from the Returns collected on the 4th June 1894, showing the Increase or Decrease on the Returns for the Years 1893 and 1892 respectively.

A.—1894 compared with 1893.

CROPS AND LIVE STOCK.	1894.	1893.	In-crease.	De-crease.	In-crease.	De-crease.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Per Cent.</i>	<i>Per Cent.</i>
Wheat - - - - -	1,927,962	1,897,524	30,438	..	1'6	..
Barley - - - - -	2,096,034	2,075,097	20,937	..	1'0	..
Oats - - - - -	3,253,145	3,171,756	81,389	..	2'6	..
Potatoes - - - - -	504,454	527,821	..	23,367	..	4'4
Hay:—Clover, & Rotation Grasses	2,121,904	2,047,008	74,896	..	3'7	..
Hay:—Permanent Pasture -	4,852,442	4,270,480	581,962	..	13'6	..
Hops - - - - -	59,535	57,564	1,971	..	3'4	..
<hr/>						
	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>Per Cent.</i>	<i>Per Cent.</i>
Cows & Heifers in Milk or in Calf	2,460,086	2,554,624	..	94,538	..	3'7
Other Cattle:—2 Years & above -	1,516,672	1,580,242	..	63,570	..	4'0
" 1 Year & under 2 -	1,217,145	1,354,523	..	137,378	..	10'1
" Under 1 Year -	1,153,210	1,211,287	..	58,077	..	4'8
TOTAL OF CATTLE -	6,347,113	6,700,676	..	353,563	..	5'3
Ewes kept for Breeding - -	9,668,002	10,128,676	..	460,674	..	4'5
Other Sheep:—1 Year & above -	6,342,730	6,911,063	..	568,333	..	8'2
" Under 1 Year -	9,850,768	10,240,595	..	389,827	..	3'8
TOTAL OF SHEEP -	25,861,500	27,280,334	..	1,418,834	..	5'2
Sows kept for Breeding - -	351,119	308,722	42,397	..	13'7	..
Other Pigs - - - - -	2,038,907	1,804,808	234,099	..	13'0	..
TOTAL OF PIGS -	2,390,026	2,113,530	276,496	..	13'1	..

B.—1894 compared with 1892.

CROPS AND LIVE STOCK.	1894.	1892.	In-crease.	De-crease.	In-crease.	De-crease.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Per Cent.</i>	<i>Per Cent.</i>
Wheat - - - - -	1,927,962	2,219,839	..	291,877	..	13'1
Barley - - - - -	2,096,034	2,036,810	59,224	..	2'9	..
Oats - - - - -	3,253,145	2,997,545	255,600	..	8'5	..
Potatoes - - - - -	504,454	525,361	..	20,907	..	4'0
Hay:—Clover, & Rotation Grasses	2,121,904	2,135,362	..	13,458	..	0'6
Hay:—Permanent Pasture -	4,852,442	4,489,626	362,816	..	8'1	..
Hops - - - - -	59,535	56,259	3,276	..	5'8	..
<hr/>						
	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>Per Cent.</i>	<i>Per Cent.</i>
Cows & Heifers in Milk or in Calf	2,460,086	2,650,891	..	190,805	..	7'2
Other Cattle:—2 Years & above -	1,516,672	1,666,706	..	150,034	..	9'0
" 1 Year & under 2 -	1,217,145	2,627,186	..	256,831	..	9'8
" Under 1 Year -	1,153,210					
TOTAL OF CATTLE -	6,347,113	6,944,783	..	597,670	..	8'6
Ewes kept for Breeding - -	9,668,002	17,957,049	..	1,946,317	..	10'8
Other Sheep:—1 Year & above -	6,342,730					
" Under 1 Year -	9,850,768	10,777,655	..	926,887	..	8'6
TOTAL OF SHEEP -	25,861,500	28,734,704	..	2,873,204	..	10'0
Sows kept for Breeding - -	351,119	—	—	—	—	—
Other Pigs - - - - -	2,038,907	—	—	—	—	—
TOTAL OF PIGS -	2,390,026	2,137,859	252,167	..	11'3	..

* Not separately distinguished in 1892.

II.—COUNTY SUMMARY.

PRELIMINARY STATEMENT of the ACREAGE under WHEAT, POTATOES, and collected on the 4th June 1894, with a

COUNTIES	Wheat.		Potatoes.		Hay.			
					CLOVER, &c.		PERMANENT PASTURE.	
	1894.	1893.	1894.	1893.	1894.	1893.	1894.	1893.
TOTAL FOR GREAT BRITAIN }	<i>Acres.</i> 1,927,962	<i>Acres.</i> 1,897,524	<i>Acres.</i> 504,454	<i>Acres.</i> 527,821	<i>Acres.</i> 2,121,904	<i>Acres.</i> 2,047,008	<i>Acres.</i> 4,852,442	<i>Acres.</i> 4,270,480
ENGLAND - -	1,826,626	1,798,869	340,557	355,553	1,558,799	1,496,467	4,178,720	3,606,918
WALES - -	56,470	54,562	34,038	35,024	170,135	168,403	510,649	499,009
SCOTLAND - -	44,866	44,093	129,859	137,244	392,970	382,138	163,073	164,553
ENGLAND.								
BEDFORD - -	40,016	35,858	8,158	9,317	13,104	12,724	34,948	25,309
BERKS - -	38,867	38,496	2,107	2,340	29,419	28,602	77,059	58,163
BUCKINGHAM - -	38,383	35,647	1,720	1,623	22,145	21,175	98,856	78,179
CAMBRIDGE - -	96,658	98,441	16,834	17,555	30,876	26,450	39,622	31,365
CHESTER - -	12,621	10,150	22,204	23,563	53,996	51,094	107,757	107,033
CORNWALL - -	27,679	27,259	5,423	5,393	43,089	37,711	40,341	34,713
CUMBERLAND - -	4,510	4,005	9,150	10,135	40,721	41,249	71,375	71,392
DERBY - -	14,581	13,280	2,391	2,718	18,177	17,358	138,173	131,842
DEVON - -	62,901	62,177	11,934	11,657	68,562	67,343	124,424	115,205
DORSET - -	21,657	22,731	1,644	1,637	28,741	26,672	95,591	77,422
DURHAM - -	16,306	13,337	7,751	7,423	40,074	38,050	94,079	93,549
ESSEX - -	124,592	118,187	10,929	10,939	58,614	54,443	114,790	84,045
GLOUCESTER - -	49,384	50,569	4,173	4,873	50,483	45,176	160,024	139,395
HANTS - -	63,603	65,983	5,474	5,294	79,530	72,868	98,399	76,123
HEREFORD - -	28,291	28,422	2,037	2,077	23,316	23,557	82,609	77,582
HERTFORD - -	52,415	48,083	4,388	4,872	29,137	28,591	64,692	47,469
HUNTINGDON - -	32,669	30,495	6,715	7,170	12,121	11,621	28,230	21,287
KENT - -	57,927	53,026	13,400	13,761	39,307	38,932	121,877	86,933
LANCASTER - -	17,356	14,676	34,734	37,647	68,464	63,744	211,210	210,711
LEICESTER - -	23,213	22,596	1,936	2,042	18,234	17,701	99,125	81,632
LINCOLN - -	180,170	180,894	47,081	47,878	85,301	84,098	109,143	95,244
LONDON - -	343	387	574	586	157	225	5,165	3,985
MIDDLESEX - -	3,614	3,940	3,333	3,592	1,604	1,665	56,343	46,015
MONMOUTH - -	7,867	7,706	1,435	1,520	11,708	11,129	69,520	64,947
NORFOLK - -	125,734	143,008	5,926	5,770	124,738	129,093	72,637	57,194
NORTHAMPTON - -	46,261	44,459	2,915	2,854	21,589	23,610	92,290	70,278
NORTHUMBERLAND - -	8,655	6,164	4,136	4,304	46,210	45,762	71,469	63,953
NOTTS - -	39,430	39,524	6,661	6,922	27,191	26,420	67,636	63,745
OXFORD - -	37,448	35,840	2,361	2,653	32,124	31,100	77,020	57,890
RUTLAND - -	5,033	5,101	127	126	2,443	2,716	12,974	9,108
SALOP - -	34,896	37,511	5,847	6,231	43,210	43,202	105,995	99,568
SOMERSET - -	33,419	32,504	4,704	5,175	26,269	25,832	247,778	192,481
STAFFORD - -	22,373	21,986	8,829	9,292	32,988	31,700	127,869	120,821
SUFFOLK - -	106,020	110,934	2,283	2,365	61,613	57,660	73,755	55,767
SURREY - -	23,442	23,058	6,260	6,353	17,375	18,872	81,813	62,677
SUSSEX - -	61,249	59,473	3,026	2,891	46,190	43,998	138,102	108,954
WARWICK - -	38,577	35,500	5,871	5,993	24,099	24,381	107,342	86,539
WESTMORLAND - -	246	236	1,471	1,734	6,510	6,307	54,262	54,353
WILTS - -	55,334	59,082	2,404	2,497	55,681	51,803	149,938	121,149
WORCESTER - -	36,695	33,882	7,584	7,929	16,710	17,313	99,727	81,778
YORK, E. RIDING - -	60,700	56,962	11,867	12,421	21,648	19,481	40,973	37,987
„ N. RIDING - -	29,013	22,521	10,596	11,132	36,695	33,575	140,885	139,144
„ W. RIDING - -	46,478	43,776	22,164	23,319	48,636	42,064	272,853	267,992

—ACREAGE.

HAY in the several COUNTIES of GREAT BRITAIN, compiled from the Returns
COMPARATIVE STATEMENT for 1893.

COUNTIES. (continued.)	Wheat.		Potatoes.		Hay.			
					CLOVER, &c.		PERMANENT PASTURE.	
	1894.	1893.	1894.	1893.	1894.	1893.	1894.	1893.
WALES.	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
ANGLESEY - -	356	344	2,880	2,982	16,058	16,384	18,862	18,952
BRECON - -	4,251	4,522	1,203	1,205	7,428	7,104	38,073	38,069
CARDIGAN - -	6,272	5,997	6,142	6,224	18,387	18,010	88,841	37,310
CARMARTHEN - -	8,679	8,630	3,670	3,774	16,249	16,205	78,599	76,304
CARNARVON - -	499	520	4,659	4,664	17,234	15,318	45,957	46,461
DENBIGH - -	6,616	5,775	3,383	3,508	20,303	21,261	39,221	38,542
FLINT - -	5,288	4,354	2,434	2,570	11,734	11,814	20,135	20,119
GLAMORGAN - -	5,540	5,521	1,975	2,115	15,858	15,426	74,650	71,278
MERIONETH - -	786	775	2,010	2,064	7,318	7,402	38,428	38,269
MONTGOMERY - -	11,548	11,420	2,169	2,294	16,037	15,742	48,114	47,673
PEMBROKE - -	3,212	3,121	2,584	2,670	16,508	16,747	45,474	41,654
RADNOR - -	3,423	3,533	929	954	7,021	6,990	24,295	24,378
SCOTLAND.								
ABERDEEN - -	2	10	7,202	7,677	46,522	45,019	2,966	3,391
ARGYLL - -	1	3	4,861	5,148	10,560	10,246	14,234	13,801
AYR - -	1,164	1,382	8,370	7,955	29,355	27,452	21,390	21,195
BANFF - -	12	9	1,976	2,035	10,855	10,784	671	832
BERWICK - -	1,715	1,996	2,189	2,349	9,111	9,177	3,505	2,936
BUTE - -	..	..	979	978	1,987	2,032	708	778
CAITHNESS - -	1	..	1,758	1,752	9,832	10,094	1,617	1,491
CLACKMANNAN - -	241	222	344	357	1,395	1,397	743	661
DUMBARTON - -	797	826	2,149	2,231	6,134	6,326	2,549	2,441
DUMFRIES - -	49	50	3,723	4,029	18,211	17,487	18,307	18,396
EDINBURGH - -	3,380	3,461	4,621	4,876	11,945	11,999	3,004	2,379
ELGIN, or MORAY - -	960	1,357	1,701	1,817	6,345	6,616	629	667
FIFE - -	9,152	9,479	14,527	15,252	25,258	25,446	7,097	6,529
FORFAR - -	7,992	6,902	12,386	13,769	20,295	19,335	2,651	3,027
HADDINGTON - -	5,492	5,922	7,269	7,802	9,392	9,576	2,137	940
INVERNESS - -	8	18	6,329	6,459	12,331	11,991	5,415	5,693
KINCARDINE - -	410	286	2,536	2,834	12,558	11,667	445	1,752
KINROSS - -	11	8	574	574	2,512	2,427	1,573	1,198
KIRKCUDBRIGHT - -	45	59	1,521	1,764	9,502	9,199	12,606	12,699
LANARK - -	1,734	1,753	4,110	4,535	32,068	30,098	12,323	13,440
LINLITHGOW - -	1,029	1,199	1,609	1,680	6,462	6,089	2,286	2,074
NAIRN - -	15	1	342	354	2,019	1,735	530	464
ORKNEY - -	..	..	2,916	2,905	8,780	8,602	1,524	1,948
PEEBLES - -	10	9	393	421	2,246	2,101	1,391	2,192
PERTH - -	5,626	4,269	13,214	14,319	29,543	28,798	13,335	14,653
RENFREW - -	1,462	1,450	2,997	3,254	12,768	11,820	7,257	7,263
ROSS and CROMARTY - -	914	825	8,032	8,482	14,003	13,871	3,503	3,505
ROXBURGH - -	367	400	1,404	1,469	8,289	8,785	5,598	5,319
SELKIRK - -	..	2	197	218	988	918	1,516	1,621
SHEPHERD - -	..	..	3,159	3,198	663	617	1,487	1,490
STIRLING - -	1,819	1,738	3,253	3,360	12,851	12,310	4,377	3,968
SUTHERLAND - -	2	6	1,697	1,738	3,783	4,124	1,570	1,497
WIGTOWN - -	456	451	1,530	1,603	4,407	4,000	4,124	4,313

II.—COUNTY SUMMARY.

PRELIMINARY STATEMENT of the NUMBER of CATTLE, SHEEP, and PIGS collected on the 4th June 1894, with

COUNTIES.	Cattle.		Sheep.		Pigs.	
	1894.	1893.	1894.	1893.	1894.	1893.
TOTAL FOR GREAT BRITAIN }	No. 6,347,113	No. 6,760,676	No. 25,861,500	No. 27,280,334	No. 2,390,026	No. 2,113,530
ENGLAND - -	4,450,607	4,744,059	15,509,995	16,805,280	2,013,823	1,793,456
WALES - -	695,000	738,608	3,078,641	3,101,890	227,668	200,676
SCOTLAND - -	1,201,506	1,218,009	7,272,864	7,373,164	148,535	119,398
ENGLAND.						
BEDFORD - -	30,772	35,452	100,411	119,575	26,504	23,690
BERKS - -	38,003	44,371	182,334	213,334	24,303	23,650
BUCKINGHAM -	66,770	74,074	188,531	219,376	28,839	26,022
CAMBRIDGE - -	49,379	55,792	209,929	238,944	41,235	40,117
CHESTER - -	169,618	177,279	78,541	97,518	70,562	61,524
CORNWALL - -	190,749	201,258	415,031	445,732	78,761	74,064
CUMBERLAND -	138,118	139,880	520,811	510,079	23,556	19,008
DERBY - -	141,010	149,923	186,188	210,127	34,504	30,501
DEVON - -	264,969	272,983	868,708	919,164	98,218	88,002
DORSET - -	79,955	83,569	383,693	410,134	53,769	47,055
DURHAM - -	71,899	72,229	217,788	227,848	12,065	9,844
ESSEX - -	72,932	86,752	276,269	330,615	84,115	80,626
GLOUCESTER -	108,506	122,204	333,855	380,025	65,910	58,818
HANTS - -	74,979	81,168	385,133	394,188	66,019	61,922
HEREFORD - -	89,934	94,709	309,441	338,559	26,417	22,598
HERTFORD - -	30,051	37,073	115,474	142,676	24,281	24,534
HUNTINGDON -	30,841	33,299	104,581	111,830	17,674	17,953
KENT - -	65,071	77,252	899,374	975,953	54,622	54,288
LANCASTER - -	225,439	236,832	308,264	316,956	55,386	44,536
LEICESTER - -	133,178	139,199	307,853	342,514	23,840	19,664
LINCOLN - -	237,055	252,912	1,153,863	1,274,316	91,121	84,478
LONDON - -	6,732	7,645	6,399	5,438	3,300	3,233
MIDDLESEX - -	16,222	18,571	18,792	24,594	12,417	12,196
MONMOUTH - -	45,433	49,276	193,005	212,595	15,093	13,016
NORFOLK - -	113,505	126,080	519,321	590,867	96,584	83,873
NORTHAMPTON -	119,617	122,679	397,595	441,317	27,876	24,296
NORTHUMBERLAND -	105,682	109,262	992,789	1,014,738	11,979	10,127
NOTTS - -	84,714	92,073	217,358	240,644	28,144	24,455
OXFORD - -	54,919	61,106	245,929	272,191	33,008	29,598
RUTLAND - -	17,613	18,459	83,152	89,380	2,496	1,981
SALOP - -	163,382	171,251	445,461	495,521	65,023	55,799
SOMERSET - -	212,476	222,732	524,097	561,712	123,833	104,051
STAFFORD - -	151,503	159,456	246,186	283,729	52,145	45,688
SUFFOLK - -	62,772	70,831	403,302	452,666	134,848	122,298
SURREY - -	40,764	46,342	74,467	80,943	22,429	21,421
SUSSEX - -	102,043	112,308	461,209	500,021	38,817	36,296
WARWICK - -	95,923	106,940	265,121	308,901	35,702	32,014
WESTMORLAND -	62,935	63,954	356,089	357,234	4,318	3,353
WILTS - -	100,349	106,175	546,335	586,750	66,308	56,260
WORCESTER - -	60,175	68,377	157,076	191,395	37,691	32,168
YORK, E. RIDING -	86,537	91,168	438,977	459,264	59,044	51,116
„ N. RIDING -	167,651	173,675	676,427	704,213	53,903	44,783
„ W. RIDING -	270,432	277,484	694,836	711,704	87,164	72,501

—LIVE STOCK.

in the several COUNTIES of GREAT BRITAIN, compiled from the Returns
a COMPARATIVE STATEMENT for 1893.

COUNTIES. (continued.)	Cattle.		Sheep.		Pigs.	
	1894.	1893.	1894.	1893.	1894.	1893.
WALES.						
	No.	No.	No.	No.	No.	No.
ANGLESEY - -	48,501	51,431	57,662	61,130	17,230	14,927
BRECON - -	39,873	41,700	460,103	452,149	8,241	6,869
CARDIGAN - -	64,708	70,059	236,260	238,123	21,718	19,431
CARMARTHEN - -	113,481	118,697	239,295	243,464	34,328	29,372
CARNARVON - -	51,581	55,293	239,309	239,740	21,701	20,948
DENBIGH - -	65,024	69,195	301,983	311,539	28,395	23,885
FLINT - -	33,078	35,028	66,655	71,286	18,099	15,584
GLAMORGAN - -	49,915	55,363	291,867	293,681	15,970	13,428
MERIONETH - -	37,839	39,895	414,911	404,716	9,043	7,838
MONTGOMERY - -	70,283	73,351	382,039	386,208	22,114	19,562
PEMBROKE - -	87,974	94,934	118,149	127,223	25,568	24,528
RADNOR - -	32,743	33,662	270,408	272,631	5,256	4,304
SCOTLAND.						
ABERDEEN - -	179,346	180,204	184,219	214,425	9,922	7,547
ARGYLL - -	61,341	62,350	1,023,351	1,050,670	4,331	3,767
AYR - -	97,184	97,540	358,761	357,612	16,835	13,484
BANFF - -	43,760	45,081	66,740	73,028	2,841	2,206
BEEWICK - -	17,570	17,725	296,548	300,516	4,001	3,660
BUTE - -	9,619	9,791	53,146	51,807	958	664
CAITHNESS - -	21,984	23,301	109,223	113,862	1,675	1,395
CLACKMANNAN - -	3,899	4,192	12,721	13,207	2,230	2,286
DUMBARTON - -	14,807	14,799	77,800	75,013	1,623	1,104
DUMFRIES - -	57,183	58,545	524,304	507,734	11,908	9,300
EDINBURGH - -	19,918	20,286	183,116	183,710	7,057	5,854
ELGIN, or MORAY - -	22,440	23,730	59,223	63,908	2,428	2,129
FIFE - -	50,236	51,079	98,826	98,383	6,300	4,622
FORFAR - -	54,406	52,396	148,993	157,480	7,942	6,073
HADDINGTON - -	10,103	9,176	127,406	129,923	1,792	1,589
INVERNESS - -	52,829	53,871	643,097	672,562	3,134	2,752
KINCARDINE - -	28,484	27,551	39,534	37,649	2,767	1,941
KINROSS - -	6,777	7,079	36,361	36,110	544	354
KIRKCUDBRIGHT - -	47,626	49,679	388,726	377,262	7,908	6,237
LANARK - -	71,094	72,192	234,919	235,469	7,788	5,784
LINLITHGOW - -	12,635	11,646	25,219	27,819	1,872	1,266
NAIRN - -	6,563	7,224	16,945	18,940	706	628
ORKNEY - -	26,256	27,487	30,864	33,639	3,493	2,836
PEEBLES - -	6,981	6,931	189,143	186,670	811	598
PERTH - -	76,521	78,060	725,285	737,150	8,849	6,878
RENFREW - -	25,658	25,926	36,761	37,204	1,499	1,150
ROSS and CROMARTY	43,315	45,808	325,269	333,778	5,293	4,548
ROXBURGH - -	17,792	17,904	511,909	507,569	3,757	3,191
SELKIRK - -	3,626	3,566	183,421	177,075	540	394
SHETLAND - -	19,028	18,961	101,413	99,032	2,877	2,882
STIRLING - -	32,103	32,247	127,631	129,025	2,520	1,966
SUTHERLAND - -	12,589	13,408	213,330	209,265	906	871
WIGTOWN - -	47,833	48,274	119,660	125,668	11,419	9,442

III.—HOP ACREAGE, 1894.

PRELIMINARY STATEMENT compiled from the Returns collected on the 4th June 1894, showing the ACREAGE under HOPS in each COUNTY of ENGLAND in which Hops were grown, with a COMPARATIVE STATEMENT for the Years 1893, 1892, and 1891.

COUNTIES.	1894.	1893.	1892.	1891.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
BERKS - - - -	11	11	10	11
GLOUCESTER - - -	39	33	39	25
HANTS - - - -	2,911	2,795	2,775	2,749
HEREFORD - - -	7,525	7,079	6,797	6,560
KENT - - - -	35,520	34,815	34,058	34,266
NOTTS - - - -	...	...	14	14
SALOP - - - -	140	123	117	112
SUFFOLK - - - -	17	21	18	20
SURREY - - - -	1,935	1,845	1,938	1,955
SUSSEX - - - -	7,589	7,326	7,124	7,150
WORCESTER - - -	3,848	3,516	3,369	3,280
Total - - -	59,535	57,564	56,259	56,142

EXPORT OF LIVE ANIMALS FROM IRELAND TO GREAT
BRITAIN.

RETURN of the NUMBER of ANIMALS exported from IRELAND to GREAT BRITAIN during the month ended 31st July, 1894, and during the first Six Months of the Year 1894, compared with the corresponding Periods of the Year 1893.

Animals.	July.		Six Months ended June.	
	1894.	1893.	1894.	1893.
	No.	No.	No.	No.
Cattle - - - -	61,737	49,823	302,089	239,654
Sheep - - - -	184,586	225,341	317,961	339,482
Swine - - - -	16,433	12,689	295,571	226,836
Goats - - - -	1,184	855	4,762	4,725
Horses - - - -	3,454	3,360	17,074	16,298
Mules or Jennets - - -	5	3	7	11
Asses - - - -	96	144	440	242
Total - - -	267,495	292,215	937,904	827,248

XVIII.—PRICES OF LIVE STOCK AS RETURNED UNDER THE MARKETS AND FAIRS (WEIGHING OF CATTLE) ACT, 1891.

The subjoined statements relate to the information collected under the provisions of the Markets and Fairs (Weighing of Cattle) Act, 1891, respecting the numbers of cattle, sheep, and swine entering certain scheduled markets in Great Britain, and the number, weight, and prices of those weighed in the markets or auction marts to which the provisions of this Act applied. The data now furnished are in continuation of the statistics laid before Parliament for the year 1893 in the paper entitled Prices of Live Stock, C. 7314.

In 14 towns in England, and five in Scotland, the market authorities of every market and fair, and the auctioneers selling at any mart where cattle are habitually or periodically sold, are required to furnish returns of the number of animals entering, and the number and weight of those animals weighed, and the prices at which they were sold, so far as the authorities and auctioneers can ascertain the same.

The total number of animals entering the 19 scheduled markets, and the number returned as weighed and priced in the first six months of the current year, compared with the similar details for the corresponding period of 1893, was as under :—

Description.					First Half Year 1893.	First Half Year 1894.
CATTLE :						
Entering markets	-	-	-	-	602,895	577,383
Weighed	-	-	-	-	47,368	47,911
Priced -	-	-	-	-	42,814	43,685
SHEEP :						
Entering markets	-	-	-	-	2,226,450	2,228,033
Weighed	-	-	-	-	20,615	23,094
Priced -	-	-	-	-	14,426	14,700
SWINE :						
Entering markets	-	-	-	-	96,321	69,539
Weighed	-	-	-	-	597	950
Priced -	-	-	-	-	135	123

The following table supplies a statement compiled from the returns sent to the Board of Agriculture by the market authorities and auctioneers, which will suffice to indicate the varying extent to which resort was had to the weighbridge in each of the 19 scheduled markets, and the number of cases where prices were ascertained in the places indicated during the half year ended 30th June 1894.

TOTAL NUMBER of Cattle, Sheep, and Swine, entering the MARKETS and MARTS of the under-mentioned Places in ENGLAND and SCOTLAND, with the Number WEIGHED, as received from the Market Authorities in the First Half-Year 1894, under the Markets and Fairs (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	Cattle.			Sheep.			Swine.		
	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.
ENGLAND.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Ashford - -	6,247	79	64	56,913	48	28	5,695	1	†1
Birmingham - -	17,518	16	3	41,679	—	—	—	—	—
Bristol - - -	26,489	—	—	66,390	—	—	17	—	—
Leicester - - -	36,373	178	178	35,627	50	50	1,580	—	—
Leeds - - -	18,061	582	—	70,461	1,461	—	3,278	817	—
Lincoln - - -	5,579	2	—	41,710	—	—	4,462	—	—
Liverpool - - -	31,712	1,439	1,439	164,229	781	781	—	—	—
London - - -	43,560	5,905	2,923	458,580	8,714	1,917	600	—	—
Newcastle-upon-Tyne	55,107	1,397	1,397	157,719	—	—	15,445	101	†101
Norwich - - -	41,378	236	236	139,253	—	—	7,832	—	—
Salford - - -	77,799	131	131	366,599	54	54	1,442	21	21
Shrewsbury - - -	18,169	1,758	1,488	20,443	8	—	4,792	10	—
Wakefield - - -	48,389	341	—	147,811	40	—	2,179	—	—
York - - -	23,583	—	—	30,439	—	—	1,805	—	—
SCOTLAND.									
Aberdeen - - -	33,005	10,664	10,664	60,909	7,510	7,510	9,106	—	—
Dundee - - -	9,405	3,900	3,883	10,711	6	—	1,474	—	—
Edinburgh - - -	33,251	14,397	*6,111	131,592	—	—	3,814	—	—
Glasgow - - -	26,004	199	199	151,443	242	215	706	—	—
Perth - - -	25,754	6,687	*1,071	75,525	4,180	4,145	5,312	—	—
TOTAL for ENGLAND	449,964	12,064	7,859	1,797,853	11,156	2,830	49,127	950	†123
TOTAL for SCOTLAND	127,419	35,847	*21,928	430,180	11,938	11,870	20,412	—	—
Total - -	577,383	47,911	*29,787	2,228,033	23,094	14,700	69,539	950	†123

* Prices for 8,282 cattle in addition to the above were quoted from Edinburgh, and for 5,616 cattle from Perth, but without distinguishing breed or quality.

† Prices given but details insufficiently furnished.

‡ The details for 21 swine only were furnished in the form prescribed.

No prices of cattle were returned in the past half year from the markets of Bristol, Leeds, Lincoln, Wakefield, or York. Norwich gave prices for only 236 head of cattle, Glasgow for 199 head, Leicester for 178 head, Salford for 131 head, Ashford for 64 head, and Birmingham for only 3 head. These numbers are obviously too few to warrant their employment for any publication of the average prices per live cwt. or stone.

On the other hand, there were four markets in England and four in Scotland, from each of which returns were received furnishing quotations of price for over 1,000 head; and the following table indicates, for the grades and qualities distinguished, the range of prices supplied from these centres as current in the two quarters of the first half year of 1894.

Places.	First Quarter.			Second Quarter.		
	Inferior, or Third Quality.	Good, or Second Quality.	Prime, or First Quality.	Inferior, or Third Quality.	Good, or Second Quality.	Prime, or First Quality.
ENGLAND:	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.
Liverpool	—	2s.	3s. 4d.	—	2s. 6d.	3s. 4d.
London	2s. 4d. to 3s. 2d.	3s. to 3s. 7d.	3s. 6d. to 4s. 8d.	2s. 6d.	3s. 4d. to 3s. 7d.	3s. to 4s. 4d.
Newcastle	—	2s. to 3s. 8d.	3s. to 3s. 2d.	—	2s. 7d. to 3s. 2d.	2s. 10d. to 3s. 8d.
Shrewsbury	1s. 2d. to 2s. 8d.	2s. to 2s. 2d.	3s. to 3s. 6d.	2s. 10d. to 2s. 2d.	2s. 4d. to 3s. 8d.	3s. 10d. to 3s. 8d.
SCOTLAND:						
Aberdeen	2s. 6d. to 2s. 2d.	3s. 8d. to 3s. 6d.	3s. 4d. to 3s. 8d.	2s. to 2s. 6d.	2s. 7d. to 3s. 2d.	3s. to 3s. 8d.
Dundee	2s. to 2s. 4d.	3s. 6d. to 3s. 6d.	3s. 2d. to 3s. 2d.	2s. 8d. to 3s.	3s. 10d. to 3s. 4d.	3s. to 3s. 2d.
Edinburgh	2s. 2d. to 2s. 7d.	3s. to 3s. 8d.	3s. 6d. to 4s. 8d.	—	2s. 2d. to 3s. 6d.	3s. 8d. to 3s. 10d.
Perth	2s. 8d. to 3s. 8d.	3s. 6d. to 3s. 2d.	3s. 6d. to 3s. 6d.	3s. 2d. to 3s.	3s. 2d. to 3s. 6d.	3s. 10d. to 3s. 2d.

In order to obtain an average quotation of prices, the aggregate of the local prices realised at the eight markets above named has been divided by the total live weight recorded, with the result shown in the following table:—

Places.	First Quarter.			Second Quarter.			Half Year.		
	Inferior, or Third Quality.	Good, or Second Quality.	Prime or First Quality.	Inferior, or Third Quality.	Good, or Second Quality.	Prime or First Quality.	Inferior, or Third Quality.	Good, or Second Quality.	Prime or First Quality.
	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.
ENGLAND:									
Liverpool	—	28 0	33 4	—	28 6	34 4	—	28 0	33 8
London	29 10	35 2	39 2	26 6	36 2	38 6	28 8	35 6	38 10
Newcastle	—	32 6	35 2	—	34 10	35 8	—	34 2	35 6
Shrewsbury	19 10	27 4	31 2	23 10	29 10	35 6	23 4	29 4	34 10
SCOTLAND:									
Aberdeen	24 8	31 11	36 4	25 4	32 2	36 4	25 0	32 0	36 4
Dundee	25 11	31 11	34 3	27 1	32 0	34 2	26 4	32 0	34 3
Edinburgh	24 11	33 6	34 8	—	33 8	35 10	24 11	33 7	34 3
Perth	29 11	32 1	33 8	30 6	32 2	34 7	30 3	32 1	34 4

In order to show the details of the prices quoted from the above-named markets for each of the breeds or classes of animals, actual sales per live weight being distinguished, the following tables, compiled from the Quarterly Summaries, are appended.

NUMBER and PRICES of **Cattle** WEIGHED in the under-mentioned Places in
First Quarter of 1894, under the Markets and Fairs

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
ENGLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Liverpool -	Irish Cross Bred -	—	—	—	453	3 6	28 0	524	4 2	33 4
London -	Devons -	—	—	—	1	4 6	36 0	4	4 10½	39 0
	Herefords -	1	3 6½	23 4	22	4 5	35 4	6	4 9	38 0
	Herefords* -	—	—	—	6	4 0	32 0	5	4 10	38 8
	Highland -	—	—	—	—	—	—	4	4 11½	39 6
	Irish Shorthorns* -	—	—	—	10	4 0	32 0	—	—	—
	Norfolks -	—	—	—	216	4 5	35 4	335	4 9	38 0
	Norfolks* -	—	—	—	36	4 4½	35 0	34	4 9	38 0
	Polled Scots -	3	4 1½	33 2	76	4 7½	37 0	361	5 1	40 8
	Polled Scots* -	—	—	—	8	4 4	34 8	28	4 11½	39 10
	Runts -	4	3 10½	31 2	—	—	—	6	4 9½	38 2
	Scotch Shorthorns -	—	—	—	—	—	—	8	4 8½	37 10
	Shorthorns -	23	3 8	29 4	105	4 3½	34 2	23	4 9	38 0
	Shorthorns* -	3	3 10	30 8	11	4 1	32 8	12	4 8½	37 6
Newcastle- upon-Tyne.	Cross Bred -	—	—	—	8	4 0	32 0	2	4 4½	35 0
	Irish -	—	—	—	—	—	—	4	4 0½	32 6
	Jersey -	—	—	—	1	2 9	22 0	—	—	—
	Polled Angus -	—	—	—	—	—	—	4	3 9	30 0
	Polled Galloways -	—	—	—	—	—	—	1	4 6½	36 2
	Shorthorns -	—	—	—	75	4 1	32 8	300	4 5	35 4
Shrewsbury	Cross Bred -	1	3 1	24 8	32	3 4½	27 0	20	3 10½	31 0
	Herefords -	—	—	—	50	3 6½	28 2	29	3 10½	31 2
	Shorthorns -	—	—	—	4	3 4½	27 2	5	3 10½	31 0
	Welsh -	—	—	—	5	3 4½	27 0	2	3 10½	31 0
	West Highland -	1	2 11½	23 6	—	—	—	6	4 0½	32 6
	Cross Bred (Stores)	7	2 5½	19 10	13	2 10½	23 0	—	—	—
	Herefords (Stores)	19	2 7	20 8	—	—	—	—	—	—
	Jersey (Stores)	1	2 6	20 0	—	—	—	—	—	—
	Shorthorns (Stores)	8	2 0½	16 2	—	—	—	—	—	—

* Sold by Live Weight.

ENGLAND and SCOTLAND, as received from the Market Authorities in the (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
SCOTLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Aberdeen -	Cross Bred -	1,202	3 0 $\frac{1}{2}$	24 6	2,851	3 11 $\frac{1}{2}$	31 8	941	4 6	36 0
	Herefords -	—	—	—	—	—	—	4	4 5	35 4
	Polled -	83	3 2 $\frac{1}{2}$	25 8	142	4 1 $\frac{1}{2}$	33 2	159	4 7 $\frac{1}{2}$	37 2
	Polled Angus -	87	3 3 $\frac{1}{2}$	26 2	156	4 3 $\frac{1}{2}$	34 6	74	4 9	38 0
Dundee -	Cross Bred -	—	—	—	22	4 0 $\frac{1}{2}$	32 6	6	4 3 $\frac{1}{2}$	34 4
	Cross Bred Polled -	3	3 6 $\frac{1}{2}$	28 2	126	3 11 $\frac{1}{2}$	31 6	124	4 3 $\frac{1}{2}$	34 6
	Cross Bred Polled*	—	—	—	5	4 0	32 0	21	4 3 $\frac{1}{2}$	34 4
	Cross Bred Short-horns.	8	3 3 $\frac{1}{2}$	26 6	120	3 11 $\frac{1}{2}$	31 8	88	4 3 $\frac{1}{2}$	34 2
	Cross Bred Short-horns.*	2	3 5 $\frac{1}{2}$	27 8	4	4 0 $\frac{1}{2}$	32 6	7	4 4	34 8
	Herefords -	2	3 4 $\frac{1}{2}$	27 2	2	3 11 $\frac{1}{2}$	31 8	29	4 4 $\frac{1}{2}$	35 2
	Herefords* -	—	—	—	8	4 0	32 0	—	—	—
	Irish Cross Bred -	83	3 1 $\frac{1}{2}$	25 0	446	4 0	32 0	325	4 3 $\frac{1}{2}$	34 2
	Irish Cross Bred* -	2	3 1 $\frac{1}{2}$	25 0	17	4 0 $\frac{1}{2}$	32 2	94	4 3 $\frac{1}{2}$	34 2
	Polled Angus -	5	3 8	29 4	—	—	—	—	—	—
Edinburgh	Shorthorns -	17	3 5 $\frac{1}{2}$	27 10	—	—	—	—	—	—
	Cross Bred -	—	—	—	2,532	4 2 $\frac{1}{2}$	33 8	—	—	—
	Polled -	—	—	—	—	—	—	18	4 2 $\frac{1}{2}$	33 6
	Polled Angus -	—	—	—	9	4 1 $\frac{1}{2}$	33 2	6	5 7	44 8
	Shorthorns -	2	2 10 $\frac{1}{2}$	23 2	127	3 10 $\frac{1}{2}$	31 0	183	4 2 $\frac{1}{2}$	33 10
	Shorthorns*	—	—	—	—	—	—	12	4 5 $\frac{1}{2}$	35 6
	West Highland -	4	3 4 $\frac{1}{2}$	27 0	—	—	—	25	4 9	38 0
	Shorthorns (Stores)*	—	—	—	20	3 10 $\frac{1}{2}$	31 0	—	—	—
Perth -	Cross Bred -	38	3 7	28 8	34	4 0 $\frac{1}{2}$	32 2	19	4 3 $\frac{1}{2}$	34 6
	Cross Bred Polled -	47	3 10	30 8	122	4 0 $\frac{1}{2}$	32 2	107	4 2 $\frac{1}{2}$	33 6
	Polled Angus -	—	—	—	4	3 11 $\frac{1}{2}$	31 6	19	4 3 $\frac{1}{2}$	34 4

* Sold by Live Weight.

NUMBER and PRICES of **Cattle** WEIGHED in the under-mentioned Places in
Second Quarter of 1894, under the Markets and Fairs

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
ENGLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Liverpool	Irish Cross Bred	—	—	—	135	3 6 $\frac{3}{4}$	28 6	327	4 3 $\frac{1}{2}$	34 4
London	Herefords	—	—	—	1	4 2	33 4	2	5 0	40 0
	Norfolks	—	—	—	91	4 5 $\frac{1}{2}$	35 8	528	4 9 $\frac{1}{2}$	38 2
	Norfolks*	—	—	—	6	4 5 $\frac{1}{2}$	35 8	36	4 8 $\frac{1}{2}$	37 10
	Polled Scots	—	—	—	43	4 7 $\frac{1}{2}$	36 10	267	5 0 $\frac{1}{2}$	40 4
	Polled Scots*	—	—	—	3	4 8	37 4	43	4 11 $\frac{1}{2}$	39 10
	Runts	—	—	—	—	—	—	13	4 10	38 8
	Scotch Shorthorns	—	—	—	86	4 7 $\frac{1}{2}$	36 10	272	4 9	38 0
	Scotch Shorthorns*	—	—	—	—	—	—	5	5 0	40 0
	Shorthorns	22	3 3 $\frac{3}{4}$	26 6	49	4 5 $\frac{1}{2}$	35 8	100	4 7 $\frac{1}{2}$	37 0
Newcastle-upon-Tyne.	Cross Bred	—	—	—	40	4 2 $\frac{1}{2}$	33 8	80	4 7	36 8
	Cross Bred*	—	—	—	—	—	—	9	4 4 $\frac{1}{2}$	35 0
	Galloways	—	—	—	—	—	—	8	4 6 $\frac{1}{2}$	36 6
	Irish	—	—	—	68	4 6 $\frac{1}{2}$	36 2	157	4 6	36 0
	Jersey	—	—	—	1	3 5	27 4	—	—	—
	Polled Angus	—	—	—	1	3 8	29 4	1	3 5 $\frac{1}{2}$	27 10
	Polled Irish	—	—	—	8	4 2 $\frac{1}{2}$	33 8	8	4 3 $\frac{1}{2}$	34 4
	Shorthorns	—	—	—	104	4 4	34 8	517	4 5 $\frac{1}{2}$	35 6
Shrewsbury	Cross Bred	—	—	—	9	3 6	28 0	17	3 11 $\frac{1}{2}$	31 10
	Herefords	2	2 11	23 4	6	3 7 $\frac{1}{2}$	29 0	54	4 1 $\frac{1}{2}$	33 2
	Polled Angus	—	—	—	1	3 0 $\frac{1}{2}$	24 4	3	4 7 $\frac{1}{2}$	37 2
	Shorthorns	1	3 4 $\frac{1}{2}$	27 2	8	3 8	29 4	16	4 2	33 4
	Welsh	—	—	—	4	3 5	27 4	8	4 0	32 0
	Cross Bred (Stores)	65	2 11	23 4	53	3 7 $\frac{1}{2}$	28 10	36	4 6	36 0
	Dexter (Stores)	3	2 8 $\frac{3}{4}$	21 10	—	—	—	—	—	—
	Herefords (Stores)	20	3 1 $\frac{1}{2}$	25 0	109	3 8 $\frac{3}{4}$	29 10	109	4 5 $\frac{1}{2}$	35 8
	Polled Angus (Stores)	—	—	—	5	4 0	32 0	25	4 5 $\frac{1}{2}$	35 6
	Shorthorns (Stores)	34	2 9 $\frac{3}{4}$	22 6	220	3 9 $\frac{1}{2}$	30 2	187	4 6 $\frac{1}{2}$	36 4
	Welsh (Stores)	87	3 1	24 8	99	3 7 $\frac{1}{2}$	29 2	10	4 0 $\frac{1}{2}$	32 4
	West Highland (Stores).	2	2 9 $\frac{1}{2}$	22 4	31	4 2 $\frac{1}{2}$	33 8	61	4 11 $\frac{1}{2}$	39 8

* Sold by Live Weight.

ENGLAND and SCOTLAND, as received from the Market Authorities in the (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
SCOTLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Aberdeen -	Cross Bred - -	1,090	3 1½	25 0	2,130	4 0	32 0	958	4 6	36 0
	Polled - -	101	3 4½	26 10	119	4 1½	33 2	118	4 8	37 4
	Polled Angus - -	79	3 5½	27 6	156	4 4½	35 2	74	4 10	38 8
	Cross Bred (Stores)	—	—	—	48	3 9½	30 2	—	—	—
	Irish Cross Bred (Stores).	—	—	—	17	3 4½	27 0	—	—	—
	Polled (Stores) -	—	—	—	75	3 10	30 8	—	—	—
Dundee -	Cross Bred - -	—	—	—	78	3 11½	31 10	—	—	—
	Cross Bred Polled -	1	3 6½	28 6	159	3 11½	31 10	197	4 3½	34 6
	Cross Bred Polled* -	—	—	—	23	4 0½	32 4	53	4 3½	34 4
	Cross Bred Short- horns.	38	3 6½	28 4	169	3 11½	31 10	159	4 3½	34 2
	Cross Bred Short- horns.*	—	—	—	4	4 0	32 0	—	—	—
	Herefords - -	—	—	—	4	4 0½	32 4	—	—	—
	Irish Cross Bred -	39	3 2½	25 8	697	4 0	32 0	546	4 3	34 0
	Irish Cross Bred* -	—	—	—	25	4 0½	32 4	101	4 3	34 0
	Polled Angus - -	3	3 6½	28 4	—	—	—	3	4 3½	34 4
	Polled Angus* - -	1	3 9	30 0	—	—	—	5	4 4½	35 2
	Irish Stores - -	—	—	—	—	—	—	12	4 0	32 0
Edinburgh	Ayrshire - -	—	—	—	8	3 6½	28 2	—	—	—
	Cross Bred - -	—	—	—	2,710	4 2½	33 6	—	—	—
	Polled Angus - -	—	—	—	—	—	—	20	4 5½	35 10
	Shorthorns - -	—	—	—	92	3 10	30 8	299	4 2½	33 8
	Shorthorns* - -	—	—	—	1	4 0	32 0	4	4 5½	35 6
	Irish Shorthorns (Stores).*	—	—	—	31	3 10	30 8	—	—	—
	Shorthorns (Stores)	—	—	—	8	3 10½	31 2	—	—	—
Perth -	Cross Bred - -	36	3 10	30 8	37	4 0½	32 2	12	4 6½	36 2
	Cross Bred Polled -	62	3 9½	30 2	270	4 0½	32 2	152	4 2½	33 10
	Cross Bred Short- horns.	—	—	—	—	—	—	14	4 1½	32 10
	Polled Angus - -	4	4 3	34 0	4	4 2½	33 6	90	4 6	36 0

* Sold by Live Weight.

Returns of the prices of Sheep under the Markets and Fairs (Weighing of Cattle) Act, 1891, have been received from eight of the scheduled markets, and in several of these cases the total of quotations has been insignificant. Only in three markets—London, Aberdeen, and Perth—have prices for over 1,000 head of weighed sheep been recorded in the past half year, and the following table shows for each of these places the number and prices of sheep weighed in the first quarter of the year 1894:—

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
ENGLAND:—		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
London	Cotswold Tup	1	3 4	26 8	—	—	—	—	—	—
	Downs	—	—	—	—	—	—	133	5 4½	42 10
	Half Bred	—	—	—	205	5 0	40 0	12	5 2¾	41 10
	Half Bred*	—	—	—	112	5 1½	41 2	30	5 4½	43 0
SCOTLAND:—										
Aberdeen	Black Face Wethers	—	—	—	53	3 6¾	28 6	330	4 7	36 8
	Cheviot Wether Hoggets.	—	—	—	—	—	—	20	4 9½	38 4
	Cross Bred	—	—	—	1,113	3 8¾	29 10	553	4 9	38 0
	Cross Bred Hoggs	—	—	—	—	—	—	35	4 2¾	33 10
	Grey Face Hoggets	—	—	—	—	—	—	115	4 8¾	37 10
	Grey Face Shearling Hoggs.	—	—	—	—	—	—	81	4 9¼	38 2
	Half Bred Hoggets	—	—	—	—	—	—	306	4 7¼	36 10
	Half Bred Hoggs	—	—	—	40	3 11¾	31 10	62	4 1¼	32 10
Perth	Black Face Ewes	289	3 7½	29 0	140	3 7	28 8	—	—	—
	Black Face Wethers	—	—	—	178	4 5½	35 6	191	4 7	36 8
	Cheviot Ewes	20	3 1½	25 0	—	—	—	—	—	—
	Cross Bred Dinmonts	—	—	—	—	—	—	40	5 1¼	40 10
	Cross Bred Hoggets	—	—	—	—	—	—	20	4 9¼	38 2
	Cross Bred Hoggs	—	—	—	81	4 5½	35 6	482	4 9½	38 2
	Half Bred Hoggets	—	—	—	83	4 6¾	36 6	102	4 8¾	37 10
	Half Bred Hoggs	—	—	—	40	4 4¾	35 2	90	4 7¼	36 10
	Shropshire Cross Bred Hoggets.	—	—	—	20	4 7	36 8	35	4 9	38 0

* Sold by Live Weight.

The number and prices of sheep reported as weighed under the Markets and Fairs (Weighing of Cattle) Act, 1891, in the before-mentioned places in the second quarter of 1894 are shown in the following table:—

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
ENGLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
London	Downs	—	—	—	20	5 2 $\frac{3}{4}$	41 10	20	5 4 $\frac{1}{2}$	43 0
	Downs*	—	—	—	—	—	—	62	5 6 $\frac{1}{2}$	44 6
	Half Bred	—	—	—	70	5 1 $\frac{3}{4}$	41 2	71	5 3 $\frac{3}{4}$	42 6
	Half Bred*	—	—	—	676	5 0 $\frac{3}{4}$	40 6	12	5 4	42 8
	United States*	—	—	—	280	5 0	40 0	—	—	—
	Yorkshire	—	—	—	20	4 11 $\frac{1}{2}$	39 6	—	—	—
	Yorkshire*	—	—	—	193	5 0	40 0	—	—	—
SCOTLAND:										
Aberdeen	Black Face Wethers	—	—	—	32	4 2 $\frac{1}{2}$	33 6	211	4 5 $\frac{3}{4}$	35 10
	Cheviot Wethers	—	—	—	—	—	—	20	4 7 $\frac{1}{2}$	36 10
	Cross Bred	—	—	—	1,899	3 11 $\frac{3}{4}$	31 10	1,559	4 8 $\frac{3}{4}$	37 10
	Cross Bred Hoggets	—	—	—	—	—	—	153	4 10 $\frac{1}{2}$	39 0
	Grey Face Hoggs	—	—	—	—	—	—	44	4 6 $\frac{1}{2}$	36 4
	Grey Face Hoggets	—	—	—	—	—	—	316	4 8 $\frac{1}{2}$	37 8
	Half Bred Hoggets	—	—	—	—	—	—	503	4 7 $\frac{1}{4}$	37 2
	Shropshire Cross Bred Hoggets.	—	—	—	—	—	—	60	4 11	39 4
Perth	Black Face Wethers	72	4 2 $\frac{1}{2}$	33 6	125	4 7 $\frac{1}{2}$	36 10	173	4 10 $\frac{1}{2}$	38 10
	Black Face Wether Hoggs.	—	—	—	—	—	—	40	5 0	40 0
	Black Face Ewes	86	3 11 $\frac{1}{4}$	31 10	—	—	—	—	—	—
	Cross Bred Hoggs	36	4 3	34 0	452	4 6 $\frac{3}{4}$	36 6	1,226	4 10 $\frac{1}{2}$	38 10
	Half Bred Hoggs	—	—	—	—	—	—	73	5 0 $\frac{1}{2}$	40 2
	Half Bred Ewes	20	3 5 $\frac{1}{2}$	27 6	—	—	—	—	—	—
	Shropshire Cross Bred Hoggs.	—	—	—	—	—	—	31	5 0 $\frac{1}{2}$	40 4

* Sold by Live Weight.

In the memorandum prefixed to the annual returns of prices of live stock published for 1893, it was pointed out that the prices of pigs were not supplied in sufficient numbers for any average quotations to be extracted from the returns for comparative purposes. Although the swine returned as having been weighed in the first half of 1894 were somewhat more numerous, the records of prices supplied have been as imperfect as before.

XIX.—STATISTICAL TABLES.

I.—PRICES OF LIVE AND DEAD MEAT.

AVERAGE PRICES of DEAD MEAT, per Stone of 8 lbs., at the
LONDON CENTRAL MEAT MARKET, during the First and
Second Quarters of 1894.

(Compiled from the prices quoted weekly in the *Meat Trades Journal*.)

DESCRIPTION.	1ST QUARTER.				2ND QUARTER.			
	s.	d.	s.	d.	s.	d.	s.	d.
BEEF :—								
Scotch, short sides - - -	4	0	to 4	4	4	2	to 4	6
„ long sides - - -	3	8	„ 3	11	3	9	„ 4	0
English, Prime - - -	3	8	„ 4	0	3	8	„ 4	0
Cows and Bulls - - -	2	5	„ 3	0	2	5	„ 2	10
American, Birkenhead killed - -	3	3	„ 3	6	3	1	„ 3	4
„ Deptford killed - -	3	3	„ 3	7	3	1	„ 3	5
„ Refrig. hind-quarters - -	3	0	„ 3	7	3	1	„ 3	7
„ „ fore-quarters - -	2	3	„ 2	6	1	10	„ 2	2
Danish sides, best - -	2	6	„ 3	0	2	6	„ 2	11
„ „ seconds - -	2	0	„ 2	3	2	0	„ 2	4
MUTTON :—								
Scotch, Prime - - -	4	0	„ 4	5	4	6	„ 4	11
„ Small Tegs - - -	4	6	„ 4	9	—			
English, Prime - - -	3	11	„ 4	4	4	3	to 4	9
Ewes - - -	3	3	„ 3	7	3	9	„ 4	0
Merinos - - -	3	9	„ 3	11	4	2	„ 4	3
Dutch - - -	3	5	„ 3	10	4	1	„ 4	5
German - - -	3	3	„ 3	10	4	3	„ 4	6
New Zealand - - -	2	10	„ 3	1	2	9	„ 3	0
Australian - - -	2	5	„ 2	8	2	4	„ 2	6
River Plate, Frozen - -	2	4	„ 2	6	2	1	„ 2	3
„ „ Town killed - -	—				3	11	„ 4	2
LAMB :—								
English - - -	6	8	to 7	8	5	7	„ 6	7
New Zealand - - -	3	5	„ 3	11	3	3	„ 3	7
VEAL :—								
English - - -	4	2	„ 5	1	4	2	„ 5	1
Foreign - - -	4	1	„ 4	11	3	11	„ 4	10
PORK :—								
English, small - - -	4	2	„ 4	7	4	1	„ 4	5
„ medium and large - -	3	5	„ 4	1	} 3 2 „ 3 10			
Foreign - - -	3	7	„ 4	2				

I.—PRICES OF LIVE AND DEAD MEAT—*continued.*

AVERAGE WHOLESALE PRICES of LIVE MEAT, per Stone of 8 lbs., sinking the Offal, at the METROPOLITAN CATTLE MARKET, during the First and Second Quarters of 1894.

DESCRIPTION.	1ST QUARTER.			2ND QUARTER.		
	Inferior.	Second.	First.	Inferior.	Second.	First.
BEEF -	<i>s. d.</i> 2 4	<i>s. d.</i> 3 11	<i>s. d.</i> 4 6	<i>s. d.</i> 2 5	<i>s. d.</i> 3 11	<i>s. d.</i> 4 6
MUTTON -	3 6	4 10	5 7	3 6	4 11	5 8
PORK -	3 0	3 11	4 6	—	—	—
VEAL -	2 5	4 6	5 9	2 5	4 7	5 8
LAMB -	6 11	7 8	8 3	6 0	6 7	7 2

AVERAGE WHOLESALE PRICES of BEEF and MUTTON, per Stone of 8 lbs., by the Carcase, at LIVERPOOL and GLASGOW, during the First and Second Quarters of 1894.

DESCRIPTION.	LIVERPOOL.*			GLASGOW.†		
	1st Quarter.		2nd Quarter.	1st Quarter.		2nd Quarter.
BEEF -	<i>s. d.</i> 2 0	<i>s. d.</i> 3 6	<i>s. d.</i> 1 10	<i>s. d.</i> 2 6	<i>s. d.</i> 3 10	<i>s. d.</i> 2 6
MUTTON -	3 4	4 10	3 4	3 8	4 8	4 0

* Compiled from information furnished by the Medical Officer of Health, Liverpool. The prices quoted are for Carcases of Animals slaughtered at the Liverpool Abattoir, and do not apply to Imported Meat.

† Compiled from information furnished by the Principal of the Veterinary College, Glasgow.

AVERAGE VALUES, per *Cwt.*, of various Kinds of DEAD MEAT Imported into the United Kingdom from FOREIGN COUNTRIES and BRITISH POSSESSIONS in the First and Second Quarters of 1894.

(Computed from the Trade and Navigation Accounts.)

PERIOD.	BEEF.		MUTTON.	PORK.		BACON.	HAMS.
	Fresh.	Salted.	Fresh.	Fresh.	Salted.		
1st Quarter -	<i>s. d.</i> 42 5	<i>s. d.</i> 31 4	<i>s. d.</i> 39 11	<i>s. d.</i> 49 1	<i>s. d.</i> 35 3	<i>s. d.</i> 45 4	<i>s. d.</i> 47 4
2nd Quarter -	40 9	29 4	40 1	47 6	30 6	42 9	47 9

II.—CORN PRICES:—ENGLAND AND WALES.

AVERAGE PRICES of **British Corn** per Quarter of 8 imperial bushels,* computed from the Weekly Averages of Corn Returns from the 196 Returning Markets, pursuant to the Corn Returns Act, 1882, together with the QUANTITIES returned as sold at such Markets, in the under-noted periods of the Years 1894, 1893, and 1892.

QUARTER ENDED	PRICES.			QUANTITIES.		
	1894.	1893.	1892.	1894.	1893.	1892.
Wheat.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	5 1	25 7	33 8	613,313	708,986	834,939
Midsummer - -	4 4	26 2	30 11	429,451	674,704	785,022
Michaelmas - -	—	26 4	29 3	—	577,112	609,916
Christmas - -	—	27 2	27 5	—	659,258	823,002
Barley.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	28 1	25 2	28 5	671,620	1,092,457	1,191,530
Midsummer - -	25 2	24 0	25 6	40,863	104,155	116,801
Michaelmas - -	—	24 1	24 3	—	248,829	42,060
Christmas - -	—	29 1	26 5	—	1,920,615	2,143,243
Oats.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	18 1	17 7	20 3	193,922	201,572	180,600
Midsummer - -	18 7	19 5	21 1	61,862	75,457	55,605
Michaelmas - -	—	19 9	20 10	—	99,899	34,898
Christmas - -	—	18 1	17 6	—	198,594	221,063

* Section 8 of the Corn Returns Act, 1882, provides that where returns of purchases of British Corn are made to the local inspector of Corn Returns in any other measure than the imperial bushel or by weight or by a weighed measure, that officer shall convert such returns into the imperial bushel, and in the case of weight or weighed measure the conversion is to be made at the rate of 60 imperial pounds for every bushel of wheat, 50 imperial pounds for every bushel of barley, and 39 imperial pounds for every bushel of oats.

II.—CORN PRICES:—ENGLAND AND WALES—*continued.*

AVERAGE PRICES of **British Corn**, per Quarter of 8 imperial bushels, computed from the Returns received under the Corn Returns Act, 1882, in each of the under-mentioned Weeks in 1894, and in the Corresponding Weeks in 1893 and 1892.

Weeks ended (in 1894)	Wheat.			Barley.			Oats.		
	1894.	1893.	1892.	1894.	1893.	1892.	1894.	1893.	1892.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
January 6 -	26 4	25 10	36 2	28 10	24 9	29 2	17 8	16 8	20 6
„ 13 -	26 4	26 4	35 6	28 10	25 6	29 3	18 0	16 11	20 7
„ 20 -	26 3	26 6	34 10	29 2	25 7	29 5	18 0	17 0	20 4
„ 27 -	26 1	26 4	33 10	29 1	25 6	28 9	18 0	17 3	20 3
February 3 -	25 7	26 3	33 1	28 11	25 4	28 7	18 1	17 5	20 2
„ 10 -	25 3	25 11	32 3	28 8	25 0	28 5	17 10	17 11	19 8
„ 17 -	24 10	25 7	32 1	28 3	24 11	28 0	18 0	17 10	20 0
„ 24 -	24 5	25 5	32 8	28 0	25 1	27 10	18 4	18 0	20 1
March 3 -	24 3	25 1	33 3	27 5	25 2	27 9	18 5	17 11	20 5
„ 10 -	24 3	25 0	32 11	27 0	25 2	27 11	18 4	18 1	20 2
„ 17 -	24 3	24 9	33 0	27 5	25 0	27 6	18 4	18 7	20 6
„ 24 -	24 4	24 8	32 8	26 11	25 5	27 9	18 1	18 3	20 4
„ 31 -	24 6	24 9	32 0	27 1	25 11	27 8	18 0	18 4	20 5
April 7 -	24 6	24 9	31 4	26 7	25 6	26 11	18 3	17 11	20 2
„ 14 -	24 7	24 10	30 7	27 10	24 8	26 10	18 2	18 7	20 7
„ 21 -	24 8	25 5	30 8	28 6	24 5	25 11	18 4	18 8	20 7
„ 28 -	24 10	25 10	31 3	26 3	24 0	26 7	18 3	19 3	21 0
May 5 -	24 10	25 10	31 6	26 1	23 11	25 10	18 7	19 5	20 7
„ 12 -	24 9	26 4	31 7	24 11	22 7	25 2	18 9	19 4	21 4
„ 19 -	24 5	27 0	31 6	25 0	23 2	24 10	18 9	19 8	21 3
„ 26 -	24 4	27 6	31 2	24 0	25 0	25 7	18 10	19 6	21 8
June 2 -	23 11	27 5	30 8	23 11	24 2	24 6	18 9	20 4	21 4
„ 9 -	23 9	27 4	30 5	26 11	22 10	25 2	18 6	20 0	21 8
„ 16 -	23 10	26 11	29 10	24 11	23 5	23 8	18 9	21 1	22 2
„ 23 -	23 11	26 9	29 6	22 5	23 3	23 4	18 10	21 3	21 10
„ 30 -	24 1	26 9	29 3	20 5	20 9	23 4	19 2	21 5	21 8
July 7 -	24 6	26 8	29 2	23 7	20 6	24 4	19 6	21 0	21 7
„ 14 -	24 5	26 8	29 1	21 0	22 3	22 4	19 7	22 3	21 5
„ 21 -	24 6	26 5	29 3	19 6	20 3	22 10	19 7	21 9	21 0
„ 28 -	24 8	26 5	29 5	22 5	23 1	21 1	20 5	21 7	21 6
August 4 -	24 4	26 2	29 7	21 4	21 8	23 8	19 8	21 5	21 6
„ 11 -	24 4	26 3	29 11	21 4	21 11	22 9	19 9	20 6	21 5
„ 18 -	24 5	26 5	29 7	16 5	22 5	24 0	18 9	19 6	21 9
„ 25 -	24 1	25 11	29 4	22 3	26 9	23 11	17 8	18 6	21 2

III.—PRICES OF BUTTER, MARGARINE, AND CHEESE.

MEAN WHOLESALE PRICES of BUTTER, MARGARINE, and CHEESE,
in the month of August, and in the First and Second
Quarters, of 1894.

(Compiled from the *Grocer*.)

DESCRIPTION.	1st Quarter of 1894.		2nd Quarter of 1894.		Month of August 1894.	
	<i>Per Cwt.</i>		<i>Per Cwt.</i>		<i>Per Cwt.</i>	
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
BUTTER :						
Clonmel - -	—	—	—	—	—	—
Corks, 1sts -	115	0 to —	88	0 to —	80	0 to —
„ 2nds -	110	0 „ —	83	0 „ —	77	0 „ —
„ 3rds -	99	0 „ —	78	0 „ —	72	0 „ —
„ 4ths -	82	0 „ —	67	0 „ —	64	9 „ —
Friesland -	106	0 „ 110 0	82	0 „ 86 0	81	6 „ 87 0
Dutch Factories -	110	0 „ 114 0	87	0 „ 91 0	85	6 „ 90 6
French Baskets -	122	0 „ 134 0	98	0 „ 105 0	94	0 „ 102 0
„ Crocks and Firkins.	107	0 „ 118 0	90	0 „ 95 0	86	0 „ 92 3
„ 2nds and 3rds	98	0 „ 103 0	83	0 „ 88 0	77	0 „ 82 0
Jersey - -	—	—	—	—	—	—
States and Canadian	69	0 „ 88 0	53	0 „ 73 0	—	—
Danish and Swedish	117	0 „ 121 0	97	0 „ 101 0	98	0 „ 102 0
Finnish - -	91	0 „ 111 0	82	0 „ 92 0	82	0 „ 90 0
Russian - -	82	0 „ 101 0	77	0 „ 88 0	74	6 „ 84 6
Colonial - -	80	0 „ 114 0	51	0 „ 94 0	—	—
Fresh Rolls (Foreign) per doz.	12	8 „ 16 0	10	4 „ 13 4	10	0 „ 13 0
MARGARINE :						
Margarine - -	38	0 „ 69 0	34	0 „ 62 0	30	0 „ 60 0
Mixtures - -	58	0 „ 94 0	56	0 „ 85 0	54	0 „ 80 0
CHEESE :						
Cheddar - -	56	0 „ 76 0	53	0 „ 75 0	49	0 „ 71 6
Somerset - -	56	0 „ 74 0	55	0 „ 73 0	53	0 „ 69 6
Cheshire - -	58	0 „ 90 0	60	0 „ 92 0	60	0 „ 83 9
Wiltshire - -	42	0 „ 71 0	40	0 „ 71 0	39	0 „ 67 6
Double Gloucester -	56	0 „ 66 0	48	0 „ 62 0	40	0 „ 60 0
Derby - -	48	0 „ 62 0	51	0 „ 61 0	48	0 „ 52 6

IV.—PRICES OF FRUIT AND VEGETABLES.

MONTHLY MEAN PRICES (WHOLESALE) of FRUIT at the under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle*.)

DESCRIPTION.	June.		July.		August.	
COVENT GARDEN :	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Currants, black, half sieve.	—	—	2 6 to 3 0		2 6 to 3 0	
Currants, red, half sieve.	—	—	1 9 „ 2 0		1 9 „ 2 0	
Apples, Tasmanian	10 0 to 14 0		—	—	—	—
Figs, per dozen	3 2 $\frac{1}{2}$ „ 4 4 $\frac{3}{4}$		1 3 „ 2 3		1 3 „ 2 1 $\frac{1}{2}$	
Grapes, 1st quality, Black English, per lb.	2 7 $\frac{1}{4}$ „ 3 1 $\frac{1}{4}$		1 9 „ 2 3		1 4 $\frac{1}{2}$ „ 1 10 $\frac{1}{2}$	
Grapes, 2nd quality, Black English, per lb.	1 3 $\frac{1}{2}$ „ 1 9 $\frac{1}{2}$		0 7 $\frac{1}{2}$ „ 1 0		0 6 „ 1 0	
Grapes, Guernsey, per lb.	1 2 $\frac{1}{2}$ „ 1 7 $\frac{3}{4}$		0 9 $\frac{3}{4}$ „ 1 0 $\frac{3}{4}$		0 7 $\frac{1}{4}$ „ 0 11 $\frac{1}{4}$	
Melons, each	1 9 $\frac{3}{4}$ „ 2 7 $\frac{1}{4}$		1 6 „ 2 6		1 4 $\frac{1}{2}$ „ 2 3	
Peaches, per dozen	5 7 $\frac{1}{4}$ „ 10 0		7 6 „ 10 9		4 6 „ 6 9	
Peaches, small, per dozen.	2 0 „ 4 0		1 9 „ 3 6		1 3 „ 4 0	
Strawberries, hot-house, morning gathered, per lb.	2 6 „ 3 6		—	—	—	—
Strawberries, by rail, per lb.	1 0 „ 2 6		—	—	—	—
Strawberries, out-door, per dozen lbs.	10 6 „ 15 0		6 0 „ 12 0		—	—
Tomatoes, per lb.	0 5 $\frac{1}{4}$ „ 0 6 $\frac{1}{2}$		0 4 $\frac{1}{2}$ „ 0 6		—	—
Cherries, half sieve	—	—	3 0 „ 5 0		2 6 „ 3 0	
FARRINGTON :						
Apples, Tasmanian, per case.	11 3 „ 12 6		—	—	—	—
Apricots, per box of 20.	0 10 „ —		—	—	—	—
Cherries, per flat	2 0 „ —		—	—	—	—
„ per lb.	0 2 $\frac{1}{2}$ „ —		—	—	—	—
Gooseberries, per half bushel or sieve.	2 6 „ 2 8		—	—	2 3 „ 3 0	
Tomatoes, Guernsey, per lb.	0 5 „ —		—	—	—	—
STRATFORD :						
Currants, black, per half sieve.	—	—	3 7 $\frac{1}{2}$ „ 4 9		3 0 „ 3 9	
Currants, red, per half sieve.	—	—	3 6 „ 4 0		2 3 „ 3 0	
Apples, Australian, per barrel.	10 0 „ 11 0		—	—	—	—
Cherries, Dutch, per basket.	—	—	1 0 „ 2 0		—	—
Cherries, French, per molly.	2 3 „ 2 9		—	—	—	—
Cherries, French, per basket.	1 9 „ 2 4 $\frac{1}{2}$		—	—	—	—
Cherries, per box	1 3 „ 2 3		—	—	—	—
Cherries, per half sieve.	—	—	3 0 „ 7 0		3 0 „ 5 0	
Gooseberries, per half sieve.	2 4 „ 3 8		2 0 „ 3 0		—	—
Gooseberries, per flat	3 6 „ 4 6		3 6 „ 4 0		—	—
Gooseberries, per half flat.	2 0 „ 2 6		—	—	—	—
Pears, per molly	—	—	1 0 „ 1 6		—	—

IV.—PRICES of FRUIT and VEGETABLES—*continued*.

MONTHLY MEAN PRICES (WHOLESALE) OF VEGETABLES at the under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle*.)

DESCRIPTION.	JULY.				AUGUST.			
	COVENT GARDEN.		FARRINGDON.		COVENT GARDEN.		FARRINGDON.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beans, broad, per sieve - -	2	0 to 2	6	—	—	2	0 to 2	6
„ „ „ bushel - -	—	—	1	6	—	—	—	—
„ French „ lb. - -	0	5½	0	9	0	4 „	0	6
Cabbages, per tally - -	—	—	2	2 „	2	10	4	0 to 5
„ Rough „ - -	—	—	1	6 „	2	0	2	2 „
Carrots, English, per dozen bunches.	—	—	1	6 „	2	0	11	½ „
Cauliflowers, per dozen - -	1	0 „	2	0	—	—	1	4½ „
Cucumbers, „ „ - -	2	0 „	3	0	—	—	1	9 „
Marrows „ „ - -	—	—	2	0	—	—	1	2½ „
Mushrooms „ lb. - -	0	8½	0	11	—	—	0	6 „
Onions, per dozen bunches *	—	—	1	9 „	2	3	—	—
Peas, per bushel - -	2	3 „	3	3	1	10½ „	2	3
„ „ sack - -	—	—	3	3 „	4	3	—	—
„ good blues, per tally - -	—	—	4	0 „	5	0	—	—
„ rough, per bag - -	—	—	2	6 „	3	0	—	—
Turnips, „ dozen bunches - -	—	—	1	9 „	2	6	—	—
DESCRIPTION.	BOROUGH.		STRATFORD.		BOROUGH.		STRATFORD.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Cabbages, per tally - -	1	5 to 2	6	1	3 to 5	0	1	9½ to 3
Carrots, Household, per dozen bunches.	1	7 „	2	7	1	5 „	2	5
Cauliflowers, per dozen - -	—	—	2	0 „	2	6	—	—
„ „ tally - -	—	—	8	6 „	12	0	—	—
Cucumbers, frame, per dozen - -	—	—	1	1 „	2	4	—	—
Green peas, sieve or bushel - -	—	—	2	0 „	3	0	—	—
„ „ per bag - -	—	—	4	0 „	6	6	—	—
Horseradish, per bundle - -	—	—	—	—	1	3 „	1	9
Lettuce, per score - -	—	—	0	8 „	1	3	—	—
Mangels, per ton - -	—	—	18	0 „	22	4	—	—
Parsley, per dozen bundles - -	1	8 „	2	3	—	—	1	6½ „
Radishes, per dozen bunches - -	—	—	1	9 „	1	0	—	—
Swedes, per ton - -	—	—	—	—	—	—	25	0 „
Turnips, per dozen bunches - -	1	9 „	2	0	1	8 „	2	8
Watercress, per dozen - -	—	—	0	6	—	—	—	—

V.—DISEASES OF ANIMALS IN GREAT BRITAIN.

NUMBER OF CATTLE returned as **SLAUGHTERED**, by order of the Board of Agriculture, on account of **Pleuro-Pneumonia**, and Number of **SWINE** returned as having **DIED** from **Swine-Fever**, or as having been **SLAUGHTERED**, by order of the Board of Agriculture, in Great Britain in each of the under-mentioned periods.

QUARTER ENDED	Pleuro-Pneumonia.			Swine-Fever.		
	CATTLE Slaughtered as Diseased, including those which were found after Slaughter to be diseased.	CATTLE Slaughtered as having been in Contact with Cattle affected or as having been otherwise exposed to infection.	CATTLE Slaughtered as Suspected, but found free from Pleuro-Pneumonia.	SWINE that Died of Swine-Fever.	SWINE Slaughtered as Diseased or as having been exposed to infection.	SWINE Slaughtered as Suspected, but found free from Swine-Fever.
	No.	No.	No.	No.	No.	No.
June 1894 - - -	8	303	16	2,186	22,306	374
March 1894 - - -	...	...	13	1,862	14,057	221
December 1893 - - -	5	422	19	*1,652	*7,536	*93
September 1893 - - -	12	389	26	1,384	2,033	...
June 1893 - - -	13	346	22	1,872	3,395	...
March 1893 - - -	...	...	19	1,259	2,438	...

* The powers vested in the Board of Agriculture under the Contagious Diseases (Animals) Act, 1893, with respect to Swine-Fever, took effect on the 1st November 1893.

NUMBER OF PLACES upon which **OUTBREAKS** were reported as having taken place, and Number of **ANIMALS** returned as having been **ATTACKED** by **ANTHRAX**, **GLANDERS**, and **RABIES** in Great Britain in each of the under-mentioned periods.

QUARTER ENDED	Anthrax.		Glanders (including Farcy).		Rabies.
	OUT-BREAKS.	ANIMALS ATTACKED.	OUT-BREAKS.	ANIMALS ATTACKED.	DISEASED ANIMALS KILLED OR DIED.
	No.	No.	No.	No.	No.
June 1894 - - -	114	259	231	351	61
March 1894 - - -	184	361	290	378	37
December 1893 - - -	179	414	312	441	45
September 1893 - - -	153	332	352	536	6
June 1893 - - -	113	267	336	498	23
March 1893 - - -	118	287	381	658	20

VI.—DISEASES OF ANIMALS IN IRELAND.

NUMBER of CATTLE returned as SLAUGHTERED, by order of the Lord Lieutenant and Privy Council in Ireland, on account of **Pleuro-Pneumonia**, and Number of SWINE returned as having Died from **Swine-Fever**, or as having been SLAUGHTERED, by order of the Lord Lieutenant and Privy Council in Ireland, in each of the under-mentioned periods.

QUARTER ENDED	Pleuro-Pneumonia.			Swine-Fever.		
	CATTLE Slaughtered as Diseased, including those which were found after Slaughter to be diseased.	CATTLE Slaughtered as having been in Contact with Cattle affected or as having been otherwise exposed to infection.	CATTLE Slaughtered as Suspected, but found free from Pleuro-Pneumonia.	SWINE that Died of Swine-Fever.	SWINE Slaughtered as Diseased, or as having been exposed to infection.	SWINE Slaughtered as Suspected, but found free from Swine-Fever.
	No.	No.	No.	No.	No.	No.
June 1894 - - -	5	932	12,060	71
March 1894 - - -	22	540	7,749	159
December 1893 - - -	25	} *409	*1,259	*34
September 1893 - - -	...	35	48			
June 1893 - - -	35			
March 1893 - - -	59			

* The powers vested in the Lord Lieutenant and Privy Council in Ireland under the Contagious Diseases (Animals) Act, 1893, with respect to Swine-Fever, took effect on the 1st November 1893.

NUMBER of Places upon which OUTBREAKS were reported as having taken place, and Number of ANIMALS returned as having been ATTACKED by ANTHRAX, GLANDERS, and RABIES in each of the under-mentioned periods.

QUARTER ENDED	Anthrax.		Glanders (including Farcy).		Rabies.
	OUTBREAKS.	ANIMALS ATTACKED.	OUTBREAKS.	ANIMALS ATTACKED.	DISEASED ANIMALS KILLED or DIED.
	No.	No.	No.	No.	No.
June 1894 - - -	...	...	4	9	213
March 1894 - - -	5	6	1	1	89
December 1893 - - -	2	3	2	6	91
September 1893 - - -	10	31	...	...	137
June 1893 - - -	5	6	2	3	122
March 1893 - - -	5	5	2	2	75

POST OFFICE SAVINGS BANKS, WITH GOVERNMENT SECURITY.

ADVANTAGES TO DEPOSITORS.

SECURITY. The Post Office Savings Banks are established by Act of Parliament, and every depositor has the *direct security* of the State for the repayment of his deposits.

DEPOSITS. Any sum from a shilling upwards, excluding pence, may be deposited at one time, and any number of deposits may be made in the course of a year (ending 31st December) up to a limit of 50*l*. A person may have 200*l*. in all on his Deposit Account, including interest.

WITHDRAWALS can be made with the utmost promptitude by sending notice by post to the London Chief Office on the form provided for the purpose, which is obtainable at any Savings Bank Office, and payment can be received at any Savings Bank Office in the United Kingdom convenient to the Depositor without regard to the Office of deposit. During any year ending 31st December, a depositor may replace the amount of any one withdrawal previously made in the same year.

INTEREST at the rate of 2*l*. 10*s*. per cent. per annum is allowed on every complete pound deposited so long as the sum to a depositor's credit does not exceed 200*l*. Whenever the balance exceeds that sum interest will be allowed on 200*l*., and the excess will be invested for the Depositor in Government Stock unless the Depositor should otherwise direct.

TRANSFER FROM A TRUSTEE SAVINGS BANK. If a Depositor in a Trustee Savings Bank wishes to place his money in a Post Office Savings Bank, he should apply to the Trustees of the Savings Bank for a Certificate of Transfer (in the form prescribed by the 10th Section of the Act 24 Vict. c. 14), and should pay the certificate into any Post Office Bank as if it were a cheque. By adopting this course, the Depositor will avoid trouble and the risk of carrying cash from one bank to the other.

DEPOSITOR'S BOOK CAN BE USED AT ANY POST OFFICE SAVINGS BANK. A Depositor may add to his deposits, or withdraw the whole or any part of them, at any Post Office Savings Bank in the United Kingdom, without change of deposit book.

NOMINATIONS. A Depositor of the age of 16 years, or upwards, may, subject to certain limits, nominate any person to receive his Savings Bank deposits at death. A form for the purpose may be obtained, free of cost, from the Controller of the Savings Bank Department.

SECRECY. The strictest secrecy is observed with respect to the names and addresses of Depositors in Post Office Banks, and the amounts deposited or withdrawn by them.

POSTAGE FREE. No charge for postage is made to a Depositor, if in the United Kingdom, for any letter passing between him and the Chief Office on Post Office Savings Bank business.

**LIST OF LEAFLETS ISSUED BY THE BOARD OF
AGRICULTURE.**

Number.	Title.
A 1.—1893 I.	The Black Currant Mite.
A 2.— „ I.	Farmers and the Income Tax.
A 3.— „ I.	Cultivation of Osiers.
A 4.— „ I.	Insects on Fruit Trees.
A 5.— „ I.	The Mangel Wurzel Fly.
A 6.— „ I.	The Field Vole and its Natural Enemies.
A 7.— „ I.	Autumn Catch Crops and Fodder Supply.
A 8.— „ I.	Farmers and Assessments to Local Rates.
A 9.— „ I.	Ensilage.
A 10.— „ I.	The Ribbon Footed Corn-Fly.
A 11.— „ I.	Anthrax.
A 12.— „ I.	The Gooseberry Saw-Fly.
A 13.— „ I.	Acorn Poisoning.
A 14.— „ I.	The Raspberry Moth.
A 15.— „ I.	The Apple Blossom Weevil.
A 16.— „ I.	The Apple Sucker.
A 17.— „ I.	Preservation of Commons.
A 18.— „ I.	Fertilisers and Feeding Stuffs Act, 1893.
A 1.—1894 I.	Mites on Currant and Nut Trees.
A 2.— „ I.	Vine and Raspberry Weevils.
A 3.— „ I.	The Diamond Back Moth.
A 4.— „ I.	The Daddy Longlegs.
A 5.— „ I.	Potato Disease.
A 6.— „ I.	The Warble Fly.

Copies of the above leaflets are to be obtained free of charge and post free on application to the Secretary, Board of Agriculture, 4, Whitehall Place, London, S.W. Letters of application so addressed need not be stamped.



From Office
31 1 14

THE New Non-Poisonous Sheep Dip

Great Economy

IN
Labour.

One
Dipping
only
Needed.

NOXONA

(The Thorncliffe Sheep Dip.)

Applied with Cold Water.

"NOXONA" possesses remarkable antiseptic properties hitherto unknown to science. It contains no chemical injurious either to men or animals, and is entirely free from the serious objections and dangers common to the old-fashioned poisonous Dips.

"NOXONA" is a sure and infallible cure for Scab. The pest eradicated with one dipping. Harmless to Animals. Destroys all Fleas, Ticks, Lice, Red Lice, and Parasites to which Sheep, Cattle, Horses, Pigs, and Dogs are subject. Warranted non-poisonous, mixes perfectly with either cold or warm water, and causes no irritation after being applied. It is a preventative against the Maggot Fly.

As a disinfectant "NOXONA" will be found excellent, compared with Carbolic Acid, in arresting putrefactive change. It can also be successfully used in dressing raw wounds and cankerous eruptions of whatsoever nature.

"Noxona,"

Sold in Quart Tins, 1/9 each; Half-Gallon Tins, 3/- each, 1, 2, 5, 10, and 20-Gallon Drums, price 5/- per Gallon. None Genuine without the Trade Mark, "NOXONA."

SOLE MANUFACTURERS—

NEWTON, CHAMBERS & CO., LTD., Thorncliffe, near SHEFFIELD.

SUTTON'S SEEDS

FOR THE

FARM

MANCEL.

"We had the best piece of Mangel in our neighbourhood from the seed I procured from you. The drought was very severe."—Mr. C. ALLAM, Bailiff to Sir T. FOWELL BUXTON, Bart.

SWEDE.

"Having grown Champion Swede over 30 years, I consider it the best and surest cropper in existence."—Mr. R. B. SMITH, Steward to the Right Hon. Lord PENRHYN.



SUTTON'S SEEDS

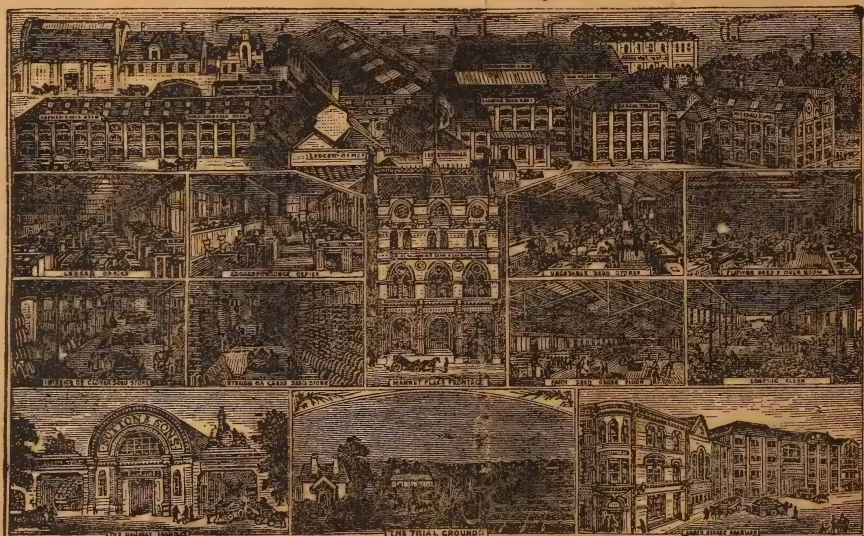
FOR THE

GARDEN

GRASS.

"In 1880-3-4 and 1887, I had the pleasure to order for Lord Hotham large quantities of Permanent Grass seeds from your firm, all of which have done well, including the park of nearly 400 acres, which is yearly improving in quality."—H. L. CHOWEN, Esq., F.S.I., Dalton Hulme.

"The late Mr. Cheney began to lay down land to Permanent Pasture at the early period of the depression, and owing to the very excellent seeds you supplied, to the extent of nearly 2,000 acres, the whole estate is now Permanent Pasture of the very best description."—CHARLES BLAND, ESQ., Gaddesby.



A MINIATURE VIEW OF THE ROYAL SEED ESTABLISHMENT, READING.

PERMANENT AND TEMPORARY PASTURES, By MARTIN J. SUTTON.

THE BEST WORK ON GRASS LANDS.

Illustrated with 23 superior Wood Engravings of Grasses, Clovers, &c. The book also contains forty-six Analyses of Grasses, Clovers, &c., prepared expressly for this work by Dr. J. Augustus Voelcker. Popular Edition, 5s., post free.

From the *Times*:—"All interested in the land will be pleased to have such a practical and scientific guide to grass land culture."

SUTTON'S FARMERS' YEAR BOOK AND GRAZIERS' MANUAL.

Contains full instructions on the laying down of land to Permanent and Temporary Pasture, particulars of the best mixtures for various soils, a price list of all the best Natural Grasses and Clovers, and much valuable information on Mangels, Swedes, Turnips, Cabbages, &c., &c. Published annually in February.

GRATIS TO CUSTOMERS.

SUTTON'S SEEDS

GENUINE ONLY FROM SUTTON & SONS, READING.

NO AGENTS

NO AGENTS.

[PRICE SIXPENCE.]

[All rights reserved.]

The Journal

OF THE

Board of Agriculture.

December 1894.

	Page
CO-OPERATIVE DAIRYING IN NEW ZEALAND	145
FRUIT FARMING	148
CIDER-MAKING IN FRANCE	152
REMISSION OF TITHE RENTCHARGE	155
FARMERS AND THE INCOME TAX	158
THE SPARROW HAWK	162
WHEAT GROWING IN THE ARGENTINE REPUBLIC	165
PRODUCTION OF FOOD GRAINS IN INDIA	172
EXPERIMENTS IN PLANTING POTATOES	176
AGRICULTURAL CREDIT BANKS IN RUSSIA	181
POULTRY REARING AND FATTENING IN SUSSEX	186
REPORTS ON FOREIGN CROPS	193
INJURIOUS INSECTS AND FUNGI	199
GENERAL AGRICULTURAL NOTES	218
EXTRACTS FROM DIPLOMATIC AND CONSULAR REPORTS	231
PARLIAMENTARY PUBLICATIONS	239
PRICES OF LIVE STOCK	250
STATISTICAL TABLES	257
IMPORTS OF HAY AND STRAW	268
OLD AGE PENSIONS	269
LIST OF LEAFLETS	272

(For detailed Table of Contents see page xv of Advertisements.)



LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,

BY EYRE AND SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from
 EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or
 JOHN MENZIES & Co., 12, HANOVER STREET, EDINBURGH, and
 90, WEST NILE STREET, GLASGOW; or
 HODGES, FIGGIS, & Co., LIMITED, 104, GRAFTON STREET, DUBLIN.

1894.

CARTERS'

HAVE BEEN

AWARDED

More

Prize

Medals



THAN

Any other

Seed House

IN THE

WORLD.

Some Important Orders entrusted to Messrs. CARTER.

FOR HER MAJESTY'S GOVERNMENT.

One Hundred and Fifty Acres of Grass Seeds.

"I have great pleasure in confirming the statement I have already made with respect to the successful results achieved on 150 acres of a barren waste after preparing for and using your Grass Seeds."—Mr. H. HACKER, Royal Engineers' Office.

FOR HER MAJESTY'S GOVERNMENT.

The whole of the Hyacinths, Tulips, and other Bulbs required to decorate the London Parks, in the Spring of 1895, are being supplied by us.

FOR THE CANADIAN GOVERNMENT.

Ten Thousand Bushels of Carter's Prize Prolific Barley were distributed to Farmers in the Dominion for improving the stocks of the Country.

IMPORTANT TESTIMONY FROM NEW ZEALAND.

"I have till lately owned the Mangatoro Station, over 30,000 acres, and have laid down in permanent pasture some **26,000 Acres** of that property with **CARTERS' SEEDS**, with widely-known and completely successful results."—November 4th, 1893.

ONE THOUSAND TONS OF SEED POTATOES

were ordered from us by the Management of the Irish Distress Fund for improving the stocks of the Country.

AN HONOUR FROM THE FRENCH GOVERNMENT.

The Ordre du Mérite Agricole—the highest distinction in French Agriculture—has been conferred upon us by the French Government, and we are the only English Seed House that has been thus favoured.

We shall be pleased to send copies of our
Illustrated Catalogues of Agricultural or Garden Seeds
post free to any part of the world on application.

Seedsmen by Royal Warrants to H.M. the QUEEN, and H.R.H. the PRINCE OF WALES,
To the Home, Colonial, and many Foreign Governments.

237, 238, and 97, High Holborn, London.



The Journal

OF THE

Board of Agriculture.

Vol. I.]

December 1894.

[No. 2.

I.—CO-OPERATIVE DAIRYING IN NEW ZEALAND.

The report for the year ending 31st March 1894 of the New Zealand Department of Agriculture contains a memorandum by the chief dairy instructor relating to the progress of co-operative dairying in the Colony. It seems that the efforts of the Department to foster, develop, and extend the success of the dairy industry have had a most satisfactory result, and at no time in the history of the Colony has such a general feeling of direct interest in, and sympathy with, dairying prevailed. Farmers are beginning to recognise that, as a branch of their operations, dairy-farming possesses capabilities of serving them well, and, as a result, they are taking a far greater interest in its development. Cheese and butter factories, and creameries have been, and are being, established in considerable numbers. On the 1st May last the dairy industry was represented in New Zealand by 178 factories and creameries, and at that date, it was expected that the number would be increased during the ensuing season by an addition of at least 30 similar establishments, erected and equipped in time to commence manufacturing operations not later than the autumn of this year. The factories and creameries run by co-operative dairy companies are stated to have given better satisfaction during the past year than at any previous time. In nearly every one of them the business is largely on the increase, and in many of them the annual output of produce has been almost doubled. It is estimated that the factories and creameries already in operation annually produce 8,167,500 lbs. of cheese and 6,722,303 lbs. of butter, valued at 144,632*l.* and 252,086*l.* respectively.

A few years ago, private dairying was, it appears, the only way for settlers in New Zealand to dispose of their milk, either in its raw state or by its conversion into butter and cheese.

Butter and cheese were made in a small way, principally for home use, or for purely local requirements, but the industry was then of little or no commercial value. Since the introduction of the factory system, the trade in dairy products has rapidly forged ahead, and promises soon to rival in quantity and value of export the frozen meat trade.

The last bad harvest, and the low prices ruling for grain, together with the uncertainty of good crops through the exhaustion of much of the land by continual cropping, is causing the settlers in many of the best grain-growing sections of the Colony to turn their attention more to dairying and stock-raising than in the past. The result of this departure will, it is observed, be the introduction of a system of mixed farming, and New Zealand farmers will not depend upon one class of produce, as in grain growing. Many of the farmers in the districts of North Otago and throughout Canterbury are said to freely admit that dairying has been the most profitable part of their farming operations for several years past.

It is felt that there is no reason why New Zealand, with her fertile soil, pure air and water, and nutritious herbage, should not occupy a position second to none as a dairy country, and as an important field in the supply of dairy produce to the English and other markets. No country, it is maintained, is capable of producing richer or better milk or producing it cheaper than New Zealand.

It will thus be seen that a fair start in co-operative dairying has been made in New Zealand. Yet the limit of possibilities in the direction of expansion is very great. There is still an immense area of land which can be profitably put under dairying, and so enormously increase the manufacture of butter and cheese. But even with the present number of factories and creameries, and the existing area of land devoted to the carrying of milch cows, it is maintained that the output can be greatly increased. In the majority of cases, the factories and creameries have been erected, and the plant built and procured, in accordance with plans and specifications provided gratuitously by the Department of Agriculture.

The New Zealand Customs Returns show the exports of dairy products in 1883 to have comprised 8,869 cwts. of butter, valued at 42,020*l.*, and 2,519 cwts. of cheese, valued at 6,892*l.* In 1893, the corresponding figures were 58,147 cwts. of butter, valued at 254,645*l.*, and 46,198 cwts. cheese, valued at 99,626*l.*

In conformity with the requirements of the "New Zealand Dairy Industry Act, 1892," and the interests of the trade in dairy produce, a careful inspection was made during the year of eight shipments of cheese and butter before embarkation. Minute examinations were also made of several lots already in steamers' chambers: 473 packages of cheese and 642 boxes of butter were opened and examined, and the brands on the packages of other consignments were submitted to a rigid

inspection. As a result of this close and careful survey, prosecutions were instituted against 11 offenders for contraventions of the branding clauses of the Act in question, and in every case convictions were obtained, the lowest penalty (5*l.*) allowed by the Act being inflicted in each instance.

It is remarked in the report that the success or failure of the New Zealand butter trade rests solely upon the quality of the goods manufactured and landed in the market; and that this depends, not only upon the kind of machinery and plant and skill employed in the making of the product, but also in the facilities for speedy and safe transit from the manufactory to the port of transhipment, proper storage at port of shipment, and care in transit on home steamers.

The chief dairy instructor hopes that something will be done to facilitate and improve the carriage of dairy produce to the port of shipment, as well as to provide for its storage at the ports while awaiting shipment. There is not the slightest doubt, in his opinion, that the chief reason why so much poor butter leaves New Zealand lies in the lack of favourable conditions for its manufacture and transit.

Another great disadvantage to the butter-making industry in the Colony is, it appears, the empirical knowledge of the butter makers employed in a great number of the factories. Through the aid of first-class buildings and machinery, the process of butter-making is now reduced in a great measure to a mere mechanical operation. As a consequence, there are men seeking and securing appointments as butter makers in factories who have not had anything like the necessary tuition in the management and care of milk and cream, not to speak of the manufacture of butter and the working of dairy factory plant and machinery, to enable them to become successful manufacturers. The chief dairy inspector recommends the employment of a large staff of trained and skilled travelling dairy instructors as the only means of overcoming this serious difficulty.

II.—FRUIT FARMING.

On more than one occasion during the past summer and autumn public attention has been directed to statements indicating a glut in the London markets of certain kinds of fruit, principally of pears and plums, prices of which ruled low, especially for fruit of common quality. It may be, however, open to question whether any appreciable portion of the abundant fruit crop of 1894 has been altogether wasted. A few damsons, whose quality and appearance had been injured by the plague of aphides early in the season, may have been left on the trees here and there; but even in the case of this extremely large crop the main bulk was utilised in some way. Though the price realised per lb. or per sieve was small, the quantity per tree, or per acre, was great.

Practical men not only hold that the fruit acreage in this country is not excessive but that it may be extended, and that fruit trees and fruit bushes may, with due regard to the dominating conditions of soil, climate, and situation, and in reasonable propinquity to populous places, still be planted with good prospects of profit. It is essential, however, that more care than is often forthcoming should be taken as to the details of cultivation, picking, packing, and sale. It should be remembered when planting that it is very desirable to ensure a regular succession of fruits. When fruit plantations are made, there should be a due proportion of each kind of fruit tree, plant, and bush suitable to the locality, in order that "all the eggs may not be in one basket." As an example of the necessity of this, it may be stated that the strawberry crop of last season, which had promised so well in the early spring, turned out a comparative failure owing to the severe frost of the 21st of May, while gooseberries and red currants were abundant. Raspberries were below the average in quantity, and sold well. Apples also were cut up by the late spring-frosts so that the crop was very small. Pears, on the other hand, yielded enormously, as the weather during their blossoming was unusually mild and genial, and the blossoms were well set and beyond danger by the date of the frost referred to when the apples suffered.

Not only must the kinds of fruit be diversified, but the best varieties of each kind should be planted, selected for their approved qualities and superiority, with due regard to the circumstances of the locality. This applies particularly to apples and pears, since the competition of America, Canada, France, and Tasmania in the supply of these fruits is exceedingly keen.

Classification of fruit, or "grading" as the Americans say, is also eminently requisite. It will not answer in these days to pack fruit just as it comes from the tree, or bush, into dirty baskets covered with damp rubbishy grass or straw, and consign it to markets to compete with the carefully assorted well packed fruit from abroad. Nor is it advisable, in seasons of great abundance, to continue to make consignments of fruit to glutted markets. In practice, it may be said, it is difficult to avoid this, but fruit suitable for conversion into jam may be made into pulp without much trouble or expense. Upon large fruit farms it would seem to be almost essential to provide apparatus for the conversion into jam of surplus, small, or over ripe fruit, and also for bottling and preserving fruit in various ways. When the fruit has been previously made into pulp, the subsequent process of jam manufacture may be carried on at slack times.

Fruit drying, as practised by American, Canadian, French, German, and Australasian fruit growers, is another means of utilising surplus fruit that could be adopted cheaply and easily in this country. Portable and inexpensive fruit drying machines can be obtained of various sizes to suit large and small holdings.

These drying machines are constantly used by a large number of American fruit-farmers on small as well as on large farms. In the plum-growing districts of France and Germany, when prices are low for fresh fruit, considerable quantities of plums are dried and exported as prunes.

A large proportion of fruit farmers send their apples and pears direct from the trees to the market, and sell them for whatever they will fetch. Much of the fruit is immature and requires to be stored, and as the sale is forced, fine fruit is often sacrificed at miserably low rates, for "smashing" or for culinary purposes. Consumers have not the inclination nor the accommodation for storing, but merely buy from hand to mouth. The obvious policy of the producers should be, therefore, to store the choice keeping sorts, and to supply the demand from day to day with seasonable, ripe, well coloured, fine flavoured fruit. There is almost invariably a great demand for fine eating and cooking apples after Christmas, because much of the crop has been sacrificed long before the fruit was ripe.

Fruit-farmers can, of their own initiative, carry out such suggestions as those described above. But there are other serious hindrances to the increase and development of fruit growing with which they cannot so easily deal. Among these may be mentioned the inadequacy of existing means and modes of distribution, and, as in most other articles produced by cultivators of the land, the absence of direct communication between the producers and the consumers.

Fruit-farmers, as a rule, consign the whole of their fruit to the nearest central fruit-market without any regard to the state of supply and demand. To some extent it may be said this is unavoidable in the case of "soft" fruit, which must be sold as it

ripens. And as by far the largest part of the fruit grown in this country is produced in counties near London, the three fruit-markets of the Metropolis—the Borough, Covent Garden, and Spitalfields—are frequently glutted in seasons like the last, and fruit is occasionally unsaleable, or is sold at absurdly low and unremunerative rates, because the supply exceeds a demand limited by the capabilities of the distributing machinery of these three centres. At the same time, in some of the suburbs of London, in many of the large provincial towns, and even in many country towns and villages, fruit is either not obtainable, or only to be purchased at prices which make it a luxury. Fruit is sometimes consigned to Birmingham, Liverpool, Manchester, and to Scotch towns, but the cost of carriage for such long transit is often prohibitory to the fruit growers in the South Eastern counties.

It is probable that many house-keepers would have rejoiced to have been able to purchase damsons and plums this season at $1\frac{1}{2}d.$ per lb., equal to 7s. per sieve, but had no chance of getting them at all. Large quantities of this fruit were retailed in shops and by costermongers at from $1\frac{1}{2}d.$ to $2d.$ per pound, while the growers obtained only $\frac{1}{2}d.$ or $\frac{3}{4}d.$ per pound, or from 2s. $4d.$ to 3s. $6d.$ per sieve in very many cases, and out of this commission and carriage, amounting to about $10d.$ per sieve, had to be paid.

Again, Williams' Bon Chrétien pears, of which the crop was large beyond precedent, could not be purchased during this last season in shops, on costers' barrows, or in retail markets under $1\frac{1}{2}d.$ per pound, or about $1d.$ per four or five full sized pears. At some distance from the large fruit markets the prices ruled higher, and in many localities the pears could not be had at any price. Yet, at the same time, numbers of the producers could get only $\frac{3}{4}d.$ to $1d.$ per pound, or from 3s. $6d.$ to 4s. $8d.$ per sieve, of about 335 pears, from which commission and carriage must be subtracted.

So long as the practice continues of consigning the chief part of the fruit grown in this country to the few existing markets there must be occasional gluts. Even in seasons of average production the grower does not get the full value of his fruit, but clings to the system because it saves trouble. He need not search for customers, and payment is punctual and certain. The system would be more defensible if there were many more markets or channels of distribution.

Direct sale to consumers has been often advocated. The Parcel Post has been recommended as a means of distribution. These methods can be adopted by small growers for the more choice and dear kind of fruit; but large fruit farmers consider them utterly impracticable as a means of disposing of large masses of fruit.

Co-operation has been tried in a half-hearted manner, as in the case of some other agricultural products, and quickly abandoned. It has been suggested that a large co-operative

central society, with branches in many places connected by telegraphs and telephones, would furnish admirable machinery for the distribution of fruit, and keep co-operating growers posted up as to where they could despatch fruit to the best advantage.

The increase in the consumption of jam by all classes of the community, and the steadily advancing demand for this agreeable and wholesome article of diet, encourage additions to the acreage of fruit land. Large quantities of fruit are taken from the markets by jam makers, fruit bottlers, and fruit preservers, and contracts are occasionally made with growers to supply wholesale quantities of various fruits suitable for jam. In many centres of fruit cultivation jam manufactories have been established which have taken quantities of fruit. In some instances these have not proved profitable because the establishments have been equipped and carried on in a costly and extravagant manner. To be of full benefit and value to fruit growers, jam factories should be founded and maintained by co-operation amongst producers of fruit. It is known that fruit has been purchased in London and consigned to jam manufactories situated in the heart of a district growing soft fruit.

The important industry of fruit preserving in the shape of jam making, fruit bottling, and fruit drying, has alone justified the extension of the acreage of fruit land in this country, and would justify a further extension if sugar should continue to be as cheap as at present. The cheapness of sugar in this country checks, if it does not prevent, competition from all other countries in respect of jams and fruit preserved with sugar, and should enable British manufacturers to do a considerably larger export trade in these commodities than at present.

Railway carriage and commission are saved in direct dealings between local growers and jam manufactories. Railway carriage is a heavy item of fruit producers' expenses. Commission charges are high, and are the same whether fruit is dear or cheap. It cannot, perhaps, be said that the railway rates for fruit carriage are very excessive in the chief fruit producing districts where large quantities are carried by trains arranged to deliver in good time for the London markets. Where small quantities are consigned by luggage trains the rates are high, and the delivery uncertain, while if the fruit is perishable, and the distance great, it may be in a bad state on delivery. Delivery by passenger train for commercial fruit is out of the question as the charge is almost prohibitive. It has been lately argued that it might be to the advantage of railway companies to encourage fruit growing by offering cheaper rates of conveyance, particularly for small quantities.

III.—CIDER-MAKING IN FRANCE.

The latest official statistics published by the French Ministry of Agriculture show that the quantity of cider produced in France in 1892 amounted to 333,109,000 gallons, or 129,000,000 gallons in excess of the production of the previous year. The average annual output of cider in the ten years 1882-1891 is stated to have been about 263,684,000 gallons. Over 60 per cent. of this quantity appears to have been manufactured in the provinces of Normandy and Brittany, which have the reputation of producing the best ciders.

French cider makers in these provinces pay great attention to the selection of the fruit. Authorities are agreed that the best cider apples are the slightly bitter, scented varieties which contain a large proportion of sugar combined with a considerable quantity of tannin and mucilage. Hubert, in his "*L'art de faire le cidre*," says that bitter apples are undoubtedly the best for cider making since they yield a juice of high density with good keeping qualities. The same writer refers to the importance of using accurate instruments for determining the density of the apple juice upon which the quality of the cider so largely depends. For this purpose a special form of saccharometer called a cider-meter (*pèse cidre*) is generally used in France, but the areometers of Baumé and Cartier are also largely employed.

The best merchantable ciders are made from a mixture of apples; consisting usually of one third sweet varieties to two thirds of bitter. In the preparation of small-cider for household consumption the proportions are generally reversed. Acid apples are seldom used. Hauchecorne, who has written a standard work on cider-making, says it is a good practice to select small fruit, because, as a rule, it will be found that a measure of small apples will weigh heavier than a similar measure of large fruit, and consequently the former contain a larger proportion of the useful constituents.

After the apples have been picked, they are left in heaps to ripen, sometimes in the open, but usually in a covered place under a shed or in a cellar, sheltered from damp.

Cider-making commences when the apples are ripe. For crushing the apples the ordinary iron crushing-machines are used on the small farms, but in larger establishments where large quantities of cider are manufactured the crushing or pulping mills are furnished with granite cylinders.

Experts differ in opinion on the question of the crushing of the pips. From some experiments conducted by M. Beyot at Caen, it would appear that in the manufacture of the best cider it is better not to crush the pips. In making second quality

cider, however, the pips are generally crushed, as their essence is considered to give a bouquet to the cider. In the preparation of cider which is to be converted into brandy, the pips are always crushed.

After the crushing process is completed, the semi-liquid pulp is sometimes macerated in open tubs from 12 to 24 hours, according to the temperature; meanwhile it is stirred two or three times. In many cases, however, the pulp is pressed once before being macerated. The juice obtained from this first operation of pressing is pure cider (*gros cidre*). In the large cider factories, the pulp after being pressed once is removed from the press, placed in tubs, and macerated for six or eight hours with water or with small cider, when it is again pressed. Cider obtained from the second and subsequent pressings is called small cider (*petit cidre*). According to Hauchecorne, it is indispensable in the manufacture of pure cider to macerate the pulp before passing it through the press. This process, he says, not only facilitates the extraction of the juice, but promotes the alcoholic fermentation of the must, impregnates the juice with the aroma of the apple, and develops a rich brown colouring matter in the pulp. Hubert states, however, that it has been conclusively proved by experiments that the cider obtained from pulp which has been subjected to maceration is never of so deep a colour as that obtained from the pulp which has been put through the press directly after leaving the crushing machine. Hand-presses are mostly employed, but hydraulic presses are used in some establishments.

In a few of the large cider factories, the juice is extracted by the process of diffusion. The diffuser usually consists of a number of closed vats of the same capacity communicating with one another. A quantity of apple pulp is placed in each vat, water is then poured into one of them and made to pass through each vat in succession, the complete operation extending over about 24 hours, when the liquid is drawn off and allowed to ferment.

Some authorities are of opinion that cider produced by this process is clearer, more aromatic and more alcoholic than that obtained by the use of presses. It may be observed, however, that Dr. Paul Kulisch, of the Royal Chemical Experiment Station at Geisenheim, who has carried out an exhaustive series of experiments in the manufacture of cider by the process of diffusion, states that the beverage produced by this method is not only always thinner and poorer in quality than that obtained by pressing, but that the yield is also inferior in quantity.

A simple process of extraction, recommended by Hauchecorne for the brewing of small-cider by labourers and others, is that known as *lixiviation*. It really is a process of diffusion on a small scale. A weighed quantity of apple pulp is macerated with an equal weight of water for about 12 hours. The liquid is then

drawn off, and immediately poured back again over the pulp, when maceration is allowed to continue for another 12 hours. The cider is then drawn off and placed in the casks. The operation is repeated once or twice, as the case may be, with the same pulp.

Hubert states the method now generally adopted in this process of lixiviation is to draw off, at the conclusion of the first 12 hours of maceration, only one-third of the liquid, which is then poured back over the pulp. This operation is repeated twice at intervals of 12 hours, when the liquid is placed in the casks to undergo fermentation. The beverage obtained by lixiviation is a small-cider of inferior strength, but it possesses an agreeable flavour and will keep for about a year in good condition.

After being filtered, the must is poured into clean casks and placed in a cellar at a temperature of 50° to 59° Fahr. in order to set up fermentation. The casks are filled up to about 4 inches from the top and the bung-hole is covered over with a piece of wood or slate weighted by a stone. If tumultuous fermentation does not set in, Hauchecorne recommends that the liquid should be stirred vigorously for five minutes twice a day, and if this fails, that the temperature of the cellar should be increased to 77° Fahr. The addition of a small quantity of must heated to 122° Fahr. is said to produce equally good results. Fermentation is also facilitated by the addition of a little cider in a state of fermentation.

Some cider makers have abandoned the system of fermentation in the casks in favour of another method whereby the must is placed in large open vats or tubs in cellars maintained at a uniform temperature of 54° to 59° Fahr. Tumultuous fermentation is said to set in readily; and, as a rule, in about four or five days the liquid is ready to be drawn off.

As soon as fermentation is over, the pure liquid is drawn off, usually by means of a syphon, into clean casks, care being taken to disturb the scum as little as possible. To obtain a perfectly clear cider, it is recommended by many writers that a solution of about 1 oz. of catechu (or better something over $\frac{1}{4}$ oz. of tannin) dissolved in two pints of cider should be added to every 22 gallons of cider. The cask is then left for a few days before the bung is finally driven in. Sometimes about a quart of olive oil is poured through the bung-hole in order to prevent the cider becoming sour and hard from contact with air.

In 1893, over 20,000 gallons of French cider and perry were imported into the United Kingdom out of a total importation in the year of 558,108 gallons, of which quantity the United States supplied 537,174 gallons.

IV.—REMISSION OF TITHE RENTCHARGE.

The Board of Agriculture have reason to suppose that owners and occupiers of lands used for agricultural purposes only are, in many instances, unaware of the provision made in the Tithe Act, 1891, for remission of such part of the tithe rentcharge on such lands as exceeds two-thirds of the assessment of the lands under Schedule B. of the Income Tax. The Board desire, therefore, to draw attention to this provision, and to the mode prescribed by the Act for giving effect to it.

The Act provides that, for the future, direct payment of tithe rentcharge shall be by the landowner; that where an occupier is liable under a contract made before the passing of the Act (26th March 1891), to pay tithe rentcharge, then he shall repay to the owner such sum as the latter has properly paid on account of the rentcharge; that a contract made after the passing of the Act for payment by the occupier shall be void; and that recovery of the rentcharge shall be through the County Court of the district, when the sum due is in arrear not less than three months.

After making provision for the procedure in the County Court, the Act proceeds as follows:—Section 8, sub-section 1: “Where
“ a sum is claimed on account of tithe rentcharge issuing out of
“ any lands, and the County Court is satisfied that, if the sum
“ claimed is paid, the total amount paid on account of the tithe
“ rentcharge for the period of twelve months next preceding the
“ day on which the sum claimed became payable, will exceed
“ two-thirds of the annual value of the lands as ascertained and
“ entered in the assessment for the purpose of Schedule B. to
“ the Income Tax Act, 1853, or as certified as herein-after
“ mentioned, the Court shall order the remission of so much,
“ whether the whole or part of the sum claimed, as is equal to
“ the excess, and the amount so ordered to be remitted shall not
“ be recoverable; and if the Court is satisfied that neither such
“ remission, nor the liability thereto, has been taken into account
“ in estimating the rateable value of the tithe rentcharge, the
“ Court may remit such amount of any then current rate
“ assessed on the owner of the tithe rentcharge as appears to
“ the Court to be proportionate to the amount of the remission
“ of tithe rentcharge.”

It is to be noted, however, that by section 8, sub-section 8, remission is confined to rentcharge on lands used solely for agricultural or pastoral purposes, or for the growth of timber or underwood. And where lands were at the commutation the subject of a special apportionment, that is, where the tithe rentcharge in respect of a larger area was, by the desire of the landowner, specially apportioned on a smaller area, so that the

smaller area bears a greater proportion of rentcharge than it would otherwise have borne, remission is not to be granted unless the Court is satisfied that the applicant would have been entitled to remission if no special apportionment had been made (section 8, sub-section 6).

The basis of any remission being the annual value for the purpose of assessment under Schedule B. of the Income Tax, it is obvious that where there is reason to think the provision will apply, attention should first be directed to seeing that the lands are correctly assessed under Schedule B. The Board have already drawn attention in a leaflet entitled, "Farmers and the Income Tax," to the statutory and other rights of persons occupying lands in regard to the assessments made upon them to income tax, and they would refer owners and occupiers to that paper, which is reproduced at page 158 of this number of the Journal.

If the lands out of which the tithe rentcharge issues are assessed under Schedule B. with other lands, the surveyor of taxes for the parish is, on application of either owner or occupier, to divide the annual value stated in the assessment between the lands out of which the tithe rentcharge issues and the other lands, and give notice of the annual value, as so determined, to the applicant and the tithe owner; and either of these parties, if dissatisfied, can appeal to the General Commissioners of Income Tax for the division in which the lands are assessed, who will finally determine the proper division of the annual value (section 8, sub-sections 2 and 3).

If in any case the annual value is not ascertained and entered in the assessment under Schedule B., the General Commissioners of Income Tax for the division are, on application of either owner or occupier, to ascertain the annual value for the purpose of Schedule B. and inform the applicant (section 8, sub-section 4).

And, on payment of 1s. the Commissioners of Taxes are to give a certificate of the annual value of any lands for the purposes of section 8. It is important that this certificate should be obtained, since, under Rule 32 of the Rules under the Act, its production at the hearing before the County Court appears to be necessary for obtaining remission.

The procedure in the County Court is shortly as follows: the tithe-owner having given the Registrar of the Court notice of his intention to apply to the Court for the recovery of the tithe rentcharge (Rule 2), the Registrar will appoint a day for the hearing, and serve notice on the owner of the lands (in the Rules termed the respondent), and also in certain cases on the occupier, at least 10 clear days before the hearing (Rule 4).

If the respondent intends to oppose he must give notice of his intention in Form 5 printed in the Appendix to the Rules, at least five clear days before the hearing (Rule 5), and must specify his intention to apply for remission, and state whether more than one tithe rentcharge issues out of the lands (Rule 32).

He must produce at the hearing the certificate of the annual value of the land before referred to.

It may be added generally that, by Rule 58, the forms set out in the Appendix to the Rules are to be used where applicable, and where not applicable forms of like character with such variations as circumstances require.

The Act (price 1½*d.*) and the Rules under the Tithe Act, 1891, (price 3*d.*), may be obtained of Messrs. Eyre and Spottiswoode, East Harding Street, Fleet Street, London, E.C.

V.—FARMERS AND THE INCOME TAX.

The Board of Agriculture consider it desirable, in view of the changes consequent on the passing of the Finance Act, 1894, to issue in a revised form the appended Memorandum prepared under the authority of the Board of Inland Revenue, and originally published in 1893 (Leaflet A 2-93), directing the attention of persons occupying lands, for the purposes of husbandry only, to their statutory and other rights in regard to the assessments made upon them to Income Tax.

By the exercise of the option (referred to in paragraph No. 3 of the following Memorandum) of being dealt with according to the rules of Schedule D. of the Income Tax Acts, occupiers of land for the purpose of husbandry only who have made no profits therefrom on the average of the three years preceding the year of assessment, or whose aggregate income from every source does not exceed 160*l.* a year, are still able to avoid assessment to income tax in respect of such occupation, provided, of course, that the returns they make on the form which will be supplied to them by the Surveyor of Taxes for assessment under Schedule D. are regarded as satisfactory by the Commissioners of Taxes. In such cases no appeal to the Commissioners is requisite, since no assessment is made, and no question arises involving payment and subsequent repayment of the tax.

Where assessments are made under Schedule B. the law provides ample means of obtaining relief if at the end of the year the farmer has made no profits, or if his profits have fallen short of the sum assessed, but by reason of the fact that the Commissioners of Taxes require the production of accounts before they issue a certificate for repayment, the process is necessarily somewhat troublesome to the farmer. It is for this reason that the making of a return for assessment under Schedule D. would in many cases be a simpler and more advantageous proceeding.

In any case of difficulty arising under any of the heads mentioned in the Memorandum, the Board recommend that application for advice and assistance should be at once made to the local Surveyor of Taxes.

MEMORANDUM.

Income Tax. Schedules A. and B. on Lands used for the purposes of Husbandry.

1. Income tax is chargeable on the annual value of lands under Schedule A. in respect of the ownership, and under Schedule B. in respect of the profits derived from the occupation. The rate of tax for 1894-5 is 8*d.* under Schedule A. and 3*d.* under Schedule B.

2. "Annual value" means the rack rent at which lands are worth to be let by the year, that is, the yearly rent which a tenant might reasonably be expected, taking one year with another, to pay for the lands, if the tenant undertook to pay all usual tenant's rates and taxes and if the landlord undertook to bear the cost of repairs and the other expenses necessary to maintain the property in a state to command that rent. The Finance Act of 1894 authorises an allowance from the assessment under Schedule A. of one-eighth part of the annual value of the lands (inclusive of farm-houses, and other buildings, if any) as determined by the Commissioners of Taxes for the district.

3. Any person occupying lands for the purpose of husbandry only may elect to be assessed under Schedule D. on the average profits of the three preceding years instead of being assessed under Schedule B. on the yearly rent or value. The election of such person to be assessed under Schedule D. must be signified by notice in writing addressed to the Surveyor of Taxes for the district on or before the 5th of June in each year. In Scotland the time within which notice must be given to the Surveyor is extended to 5th August.

4. Meetings of the Commissioners of Taxes are held annually between the 29th of September and the 25th of December for the purpose of hearing appeals under Schedules A. and B. and D. In England and Wales intimation of the dates of these meetings is given by notice affixed to church and chapel doors, and any person aggrieved by the assessments made upon him may appeal, on giving 10 days' notice of his intention, either to the local assessor or to the district Surveyor of Taxes. In Scotland notice of intention to appeal should be sent to the Surveyor of Taxes for the district within 10 days after receipt of the notice of assessment, and thereafter intimation will be given of the place and date of meeting of the Commissioners.

5. The Commissioners also hold meetings after the expiration of the year of assessment for the purpose of hearing appeals by persons who have paid income tax in the previous year under Schedules B. or D. on amounts in excess of the actual profits made in that year.

6. Persons who desire to appeal with a view to obtain repayment on the ground of loss or diminution of profits must apply to the Surveyor of Taxes within six months from the 5th of April for information as to the time and place of meeting of the Commissioners.

7. Persons who have sustained a loss by farming operations may obtain repayment of the tax paid under Schedules B. or D., and also of a proportionate amount of the tax paid in respect of their incomes (if any) derived from sources other than from the occupation of land.

8. The following printed form of account of profit and loss for the use of farmers has been provided by the Commissioners of

Inland Revenue, and may be obtained on application to any Surveyor of Taxes.

No. 79D. Farmers' Appeals.

INCOME TAX.

Parish of _____

County of _____

STATEMENT of PAYMENTS and RECEIPTS in respect of lands in my occupation for the purposes of HUSBANDRY (particulars of which are entered at the back of this form) for the year ending _____

PAYMENTS:—	£	s.	d.	RECEIPTS:—	£	s.	d.
Live stock bought - - -				Live Stock and Wool sold - - -			
Corn and Seeds bought for seed - - -				Corn and Seeds sold - - -			
Feeding Stuffs, Oil Cake, and Manure bought - - -				Dairy Produce and Poultry sold - - -			
Rent (including Tithes) - - -				Other Produce, including Hay, Straw, or Roots where sold - - -			
The amount of the Schedule A. assessment where the occupier is also the Owner - - -				Labour, Stock, Implements, &c., hired out - - -			
Rates, Taxes, and Insurance of Farm Stock - - -				Taking in Sheep or Cattle to graze - - -			
Labour on the Farm - - -							
*Tradesmen's accounts for Goods supplied, or work done upon the Farm - - -				OTHER RECEIPTS, viz.:—			
*Sundries - - -				Value of Farm Produce used by Household - - -			
	£				£		

* Disbursements or Expenses for the maintenance of the Occupier of the Lands or of his family are not to be included.

Form of Declaration to be filled up and signed.

I solemnly and sincerely declare that the amount of live and dead stock and produce upon my holding on* the _____ day of _____ 18____, did not differ materially for the purposes of this account from the average amount in hand on the corresponding day of previous years [† except in the particulars stated below, which are true to the best of my knowledge and belief].

* Name the day to which accounts are made up. † Strike out the words in brackets if the amount is the average one.

Particulars of difference referred to above.

Description of Stock and Produce.	Increase.	Decrease.

Signature _____

Postal Address _____

Date _____ 189 .

9. The Commissioners of Inland Revenue have instructed their officers not to object to the admission of farming accounts made up annually from Michaelmas Day instead of from Lady Day.

10. Under the Finance Act of 1894 any person whose total income from all sources is proved not to exceed 160*l.* is exempt from the payment of Income Tax. Where the income from all sources exceeds 160*l.*, but does not exceed 400*l.*, the person is entitled to claim an abatement of duty on 160*l.* Where the income from all sources exceeds 400*l.* but does not exceed 500*l.* an abatement can be claimed of the duty on 100*l.* Where owners of land make any claim of exemption or abatement, the annual value of the lands assessed under Schedule A. should be taken (for the purpose of the claim) to be the amount of the

assessment after deduction of the allowance of the one-eighth mentioned in paragraph 3.

11. *Remission of Rent*.—Where temporary abatements or remissions of rent have been allowed, a reduction or repayment of duty may be claimed in respect of the amount remitted for each complete year ending on the 5th of April. This allowance may be claimed under both Schedules (A. by the landlord, B. by the tenant) on a special form of claim which will be supplied by the Surveyor of Taxes. When the remission has the effect of bringing the total income of the tenant to an amount not exceeding 160*l.* the whole of the duty paid or payable under Schedule B. will be repaid or allowed to the tenant.

12. Further information on any of the points mentioned in this memorandum may be obtained from the Surveyor of Taxes for the district, who will take steps to afford proper facilities to all persons who desire to appeal with the object of obtaining relief from or the repayment of Income Tax.

VI.—THE SPARROW-HAWK

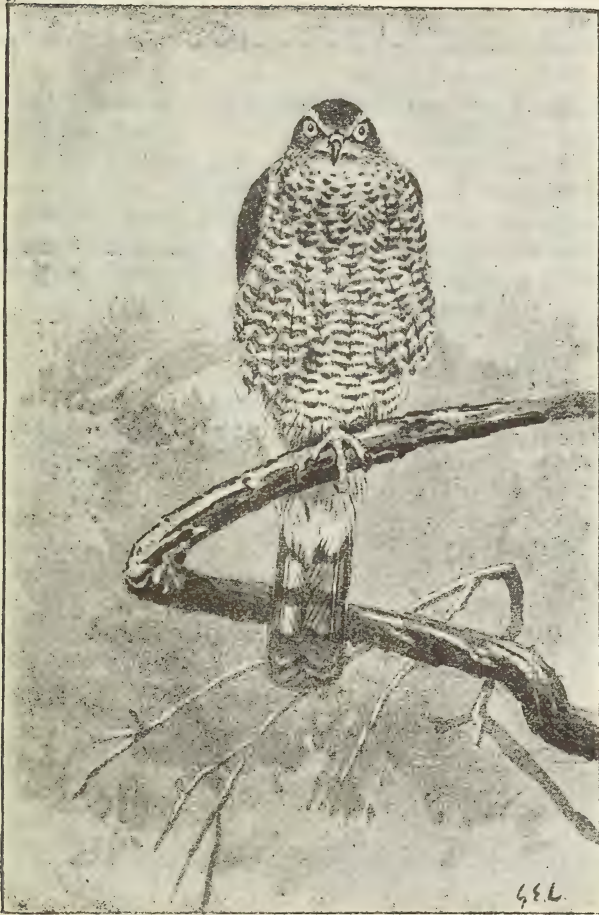
(Accipiter Nisus).

This hawk is somewhat smaller than the Kestrel or Wind-hover, *Falco tinnunculus*, described in the first number of this Journal. The male is about 12 inches in length, and the female is generally from $2\frac{1}{2}$ to 4 inches longer. The upper part of the body of the male is of a bluish-slate colour, while the under part is brown, or greyish brown, with bars of darker colour. In the female the body is brown, and the under parts light grey with brownish bars. Both male and female have a blue beak and yellow legs and feet. The wings are short. Unlike the Kestrel, the Sparrow-hawk generally builds a nest of sticks in trees, in oaks and firs by preference, usually in the depths of woods. In the beginning of May it usually lays five or six round eggs of a bluish-green colour with shades or spots of brown.

The Sparrow-hawk may be distinguished at once by its peculiar flight. At one time it is seen high up in the air, propelling itself by the use of its wings, then skimming along for a while without their motion. When in pursuit of prey it dashes with incredible velocity through trees and underwood, into stack yards and poultry yards, or swoops down with almost lightning rapidity upon a sparrow or other small bird, or, it may be, a young chicken, frequently quite regardless of the close presence of man.

Though termed Sparrow-hawk, it does not confine its attention to sparrows, but captures many kind of small birds, especially chaffinches and other finches, blackbirds, thrushes, wrens, and titmice. Ritzema Bos says, in his *Tierische Schädlinge und Nützlinge*, that it is considered injurious in Germany, because it kills so many insect-destroying birds. In France, according to Brocchi, it has the same reputation.

The Sparrow-hawk has a bad character in Great Britain, at least among game-preservers and keepers, and poultry women. This is justified to some extent, for it undoubtedly takes young partridges, pheasants and rabbits, particularly when it has young ones, and is a far worse offender in this respect than the Kestrel, which rarely takes birds of any kind. Careful observers who have watched the nests of Sparrow-hawks have remarked that the feathers round the nest and in the pellets are chiefly those of small birds, but the feathers of game and chickens are sometimes found. If the little piles of feathers and bones often seen by the sides of woods and hedgerows, and on banks, constituting the remains of a Sparrow-hawk's meal are examined, it will be noticed they are in the main those of small birds and mice, and not infrequently of frogs and rabbits. Selby states that in a nest



THE SPARROW-HAWK (*Accipiter Nisus*).

containing five young Sparrow-hawks, he found a lapwing, two blackbirds, a thrush, and two green linnets, all recently killed and partly divested of their feathers. It is the natural habit of the Sparrow-hawk to hunt for food towards dusk, when young partridges are safe under the hen, and young pheasants are in their coops, or under their foster mothers, though when a pair have young in their nest they hunt early and late. At this time, without doubt, they take young game birds, and are a cause of considerable anxiety to game-keepers who have young birds in their vicinity.

Mice, voles, and insects are sometimes taken by this hawk. Seebohm says that it is beneficial because it kills wood pigeons, which are a fearful pest to the farmer in some localities. This is corroborated in the evidence cited in the Report on the Protection of Wild Birds of the House of Commons Committee in 1873, to the effect that the wood pigeon is the natural food of the Sparrow-hawk, which is the only bird that can catch it.

Upon the whole, in view of this evidence and of the opinions of several well-informed writers, and of observant countrymen, on the habits of birds, the Sparrow-hawk ought not to be ruthlessly destroyed, and farmers would do well to exert their influence to prevent the wholesale and indiscriminate destruction of this and other hawks and owls and other useful birds, as well as such animals as weasels and stoats, which keep down rats, mice, voles, and other vermin.

VII.—WHEAT GROWING IN THE ARGENTINE
REPUBLIC.

Previous to 1887, the importation of wheat from the Argentine Republic into the United Kingdom was a matter of comparative insignificance. But in 1887, the South American State in question entered the ranks of the ten countries severally furnishing wheat to Great Britain, at that period, in shipments of 50,000 tons and upwards. In every subsequent year, with the exception of 1889, the receipts of Argentine wheat at British ports have been sufficient in volume to make it manifest that the Republic is to be regarded as a serious competitor by the grain exporting countries. Our average receipts of wheat from this source in 1890 and 1891 exceeded 130,000 tons. In 1892, Argentina sent us nearly 190,000 tons, while in the following year, she held the fourth place among the countries contributing to the supply of our staple food grain with a shipment little short of 400,000 tons. But this latter quantity has already been surpassed by the imports of Argentine wheat into this country in the ten months ended October last, which are estimated to have amounted to 576,000 tons. This is a far larger quota than that furnished during the same period by India, Australasia, and Canada combined, and it places the Republic in the third place among the countries exporting wheat to Great Britain.

Under these circumstances, an inquiry as to the conditions of wheat growing, which have led to such remarkable results, cannot fail to be of interest. Unfortunately, the amount of official information on this point is comparatively scanty; recourse must therefore be had to such individual statements as may in any way assist in throwing light on the subject. Statements of this nature must necessarily be regarded with some caution, but they may be offered for what they are worth.

According to a report by the United States Minister at Buenos Ayres, it would appear that the area devoted to wheat in 1894 in the Argentine Republic has been about 20 per cent. in excess of that sown with the same cereal last year. The wheat acreage of 1893 was estimated by Mr. Gastrell, Her Majesty's Vice-Consul at Buenos Ayres*, at approximately 5,500,000 acres, and this area, it was stated, represented an increase of about 83 per cent. over that of 1891.

The progressive development of wheat growing in the Republic may be seen from the following figures of the estimated acreage under that cereal at different periods. The figures for the first four years are from official sources, those for 1893 are taken from Mr. Gastrell's report, while the acreage of 1894 is based on

* *Foreign Office Reports, Annual Series, No. 1,283*

the reported increase over the estimated acreage of the previous year:—

Year.			Wheat Area.	Year.			Wheat Area.
			Acres.				Acres.
1875	-	-	271,436	1892	-	-	3,265,340
1883	-	-	601,445	1893	-	-	5,500,000
1888	-	-	2,036,254	1894	-	-	6,600,000

From the above, it would appear that the acreage has more than doubled within the last three years. As regards the possibilities of further extension, it may be observed that a Mr. Alois E. Fliess has estimated the area suitable for the cultivation of cereals at about 240,000,000 acres, but Mr. Gastrell thinks it probable that this estimate is considerably too high.

The exports of wheat from the Argentine Republic are shown in the official returns as under:—

Year.			Export.	Year.			Exports.
			Cwts.				Cwts.
1871	-	-	176	1883	-	-	1,193,395
1872	-	-	341	1884	-	-	2,131,235
1873	-	-	97	1885	-	-	1,541,834
1874	-	-	7,022	1886	-	-	743,765
1875	-	-	—	1887	-	-	4,672,366
1876	-	-	410	1888	-	-	3,514,662
1877	-	-	3,921	1889	-	-	447,982
1878	-	-	50,039	1890	-	-	6,430,064
1879	-	-	504,219	1891	-	-	7,769,834
1880	-	-	22,896	1892	-	-	9,234,303
1881	-	-	3,085	1893	-	-	19,802,691
1882	-	-	33,497	1894(first 6 months)	-	-	20,223,225

In view of the steadily increasing acreage under wheat it may be of interest to consider the position of the Argentine farmer as affected by the continued fall in the price of that cereal.

Several independent calculations have been made of the cost of producing wheat in the Argentine Republic, and with reference to those reproduced in the following pages, it should be borne in mind that in the conversion of the paper dollar, the gold premium has been taken at 200, following the course adopted in Mr. Gastrell's report. In that report it is stated that the cost in 1893, was about 21s. 6d. per acre, or, taking the average production at 15 bushels, about 1s. 5d. per bushel, including all expenses and cost of bags up to delivery at the nearest railway station.

Mr. Findlay, Second Secretary in Her Majesty's Legation at Buenos Ayres, has been informed by Mr. T. H. Sams, who is said to be one of the best authorities on the subject of the Argentine wheat industry, that the average cost of producing a bushel of wheat in 1893-94 was about \$1.05, which would be approxi-

mately equal to 1s. 5d. per bushel. It will be seen that Mr. Sams' estimate of the cost of production per bushel corresponds with that previously quoted. The same authority has recently published the following statement* as to the position of the Argentine Republic as a wheat-producing State. In this statement the outlay and receipts on an ordinary Argentine wheat farm of about 500 acres are shown as under. The figures which are given in the original in paper dollars have been converted, at the rate of \$15·12 to the pound sterling, or roughly, 1s. 4d. per paper dollar.

Estimate No. I.—Farm of 500 acres.

		Paper Dol- lars.	Paper Dol- lars.	Gold Value.	
		\$	\$	£ s. d.	£ s. d.
Houses and furniture, well, fencing round paddock, and sheds			1,500		100 0 0
Live stock	{ 20 oxen at \$60	1,200		80 0 0	
	{ 4 horses at \$40	160	1,360	10 13 4	90 13 4
Machinery	{ 1 two-furrow plough	150		10 0 0	
	{ 3 single-furrow ploughs	75		5 0 0	
	{ 2 harrows	100		6 13 4	
	{ hoes, spades, and forks	150		10 0 0	
	{ harness	100		6 13 4	
	{ 3 carts	750		50 0 0	
	{ 1 binder-reaper	750		50 0 0	
	{ sundries	65	2,140	4 6 8	142 13 4
Capital account			5,000		333 6 8
Labour	{ 1 man for 12 months at \$25 per month	300		20 0 0	
	{ 1 boy " " " " \$15 " "	180		12 0 0	
	{ 2 extra men for 2 " months during ploughing and seed time at \$25 each per month	100		6 13 4	
	{ 3 extra men at harvest time for one month at \$50 each	150	730	10 0 0	48 13 4
Living	{ keep of 1 man and boy for 12 months at \$15 each	360		24 0 0	
	{ keep of 2 men 2 months	60		4 0 0	
	{ keep of 3 men 1 month	45		3 0 0	
	{ keep of self and family for the year	500	965	33 6 8	64 6 8
Rent of 480 acres, at \$10 per cuadra			1,200		80 0 0
Seed for 400 acres, at 3s. 4d. per bushel (400 bushels) (100 cuadras, at \$10 per fanega, counting 1 fanega to the cuadra)			1,000		66 13 4
Interest on capital of \$5,000 at 10 per cent.			500		33 6 8
Depreciation on machinery, \$2,140 at 15 per cent.			321		21 8 0
			4,716		314 8 0
Sale of 8,000 bushels at 1s. 6½d. per bushel delivered at nearest railway station (2,000 fanegas at \$4·70 per fanega)			9,400		626 13 4
Cost of harvesting—Twine for binder, 500 kilos at 50 cents.		400		26 13 4	
Stacking		50		3 6 8	
Threshing 8,000 bushels at 4d. per bushel, 200 fanegas at \$1		2,000		133 6 8	
Sacks for 8,000 bushels, 2,500 at 30 cents		750		50 0 0	
Add as above—					
Labour		730		48 13 4	
Living		965		64 6 8	
Rent		1,200		80 0 0	
Seed		1,000		66 13 4	
Interest and depreciation		821		54 14 8	
Carting to station at 1d. per bushel carting at 25 cents per fanega		500	8,416	33 6 8	561 1 4
Balance profit			984		65 12 0

* Cf. *South American Journal* of Oct. 13, 1894, with quotation from *Aberdeen Free Press*.

The rent of \$10 per cuadra, roughly 3s. 4d. per acre, may, it appears, be considered rather a high average, for while in some districts rents range from \$15 to \$20 per cuadra, land can generally be obtained at a rental below \$10. It is further observed that a large number of farmers own their land, which many of them purchased some years ago when the freehold prices were considerably cheaper than they are at the present time. The cost of seed is also put down at a higher figure than would usually be paid for it, and the allowance of about $\frac{2}{3}$ ths of a bushel per acre is regarded as liberal and more than is necessary.

From this statement it will be seen that for a farm of about 480 acres, of which 400 acres is under wheat, it is estimated that a capital of about \$5,000 or 333*l.* is required. The cost of production works out to 1s. 5d. per bushel, the yield being calculated at 20 bushels per acre.

On the average yield of previous harvests, viz., 15 bushels per acre, the cost of production would be increased to something over 1s. 7 $\frac{1}{2}$ d. per bushel. Mr. Sams is of opinion, however, that with improvements in the methods of cultivation, the rich soils of Argentina will produce, on an average, yields of 20 bushels and upwards per acre. In the harvest of 1893-94, the yield in many districts was over 20 bushels, and in some as much as 34. It may be observed here also that an official estimate published in 1889 represented the average yield of wheat per acre at 17 bushels.

In the case of wheat intended for export, there must be added to the above estimate of the cost of production the expense of conveying the grain to the port of shipment, and of its subsequent transport to Europe. These charges have been calculated to amount on the average to about 8d. or 9d. a bushel.

Some further calculations of the cost of production were published in the *Buenos Ayres Standard* of September 14th, 1894, and are reproduced below. These calculations, which are based upon information obtained from practical men in Santa Fé,

Estimate No. II.—Farm of 400 acres.

	Paper Dollars.	Paper Dollars.	Gold Value.	
OUTLAY.	\$	\$	£ s. d.	£ s. d.
Cost of ploughing and planting	500	—	—	33 6 8
Seed wheat	650	—	—	43 6 8
Reaping and stacking	1,500	—	—	100 0 0
Threshing	3,500	—	—	233 6 8
4,000 sacks at 36 cents each	1,440	—	—	96 0 0
Carting to station	500	—	—	33 6 8
Wheat tax	250	8,340	—	16 13 4
			—	556 0 0
RECEIPTS.				
10,000 bushels of wheat at \$1·25	12,500	—	833 6 8	—
Less 13 per cent. for rent	1,625	10,875	108 6 8	725 0 0
Net profit	—	2,535	—	169 0 0

Cordoba, and Rosario, show the expenditure and receipt on a wheat farm of 400 acres occupied at a rental of 13 per cent. of the crop, the occupier being assisted by his family in ploughing reaping, and other operations.

The above represents a profit of \$2,535, or 169*l.*, but it should be observed that this estimate is based upon a yield per acre of about 25 bushels, which is 10 bushels in excess of what has generally been regarded as the average production per acre. It should also be noted that no allowance is made for cost of living, interest on capital, and depreciation.

One drawback to the future successful competition of the Argentine Republic is said to be the heavy cost of bags. In one instance, according to the *Buenos Ayres Standard* of September 19th, 1894, a sum representing 800*l.* sterling was paid by a colonist for bags in which to export his wheat this season. The colonist referred to, who is reported to be the largest wheat grower in the Republic, furnishes some particulars as to the cost of wheat growing in Santa Fé. He takes the case of an Italian colonist, with a family to help him, renting a farm of 480 acres within three leagues of a station, at a rental of 15 per cent. of the crop. An Italian farmer, it is stated, occupies only as much land as his family can cultivate with the aid of a couple of extra hands at harvest time for about 20 days. The cost of production, not including food and clothing, is shown in this case as follows:—

Estimate No. III.—Farm of 480 acres.

	Paper Dollars.	Gold Value.
OUTLAY.	\$	£ s. d.
Wear and tear of machinery - - - - -	300	20 0 0
Seed - - - - -	600	40 0 0
Harvesting - - - - -	400	26 13 4
Threshing 7,200 bushels at 4½ <i>d.</i> per bushel - - -	1,980	132 0 0
Bags - - - - -	900	60 0 0
Tax - - - - -	180	12 0 0
Total outlay - - - - -	4,360	290 13 4
Rent - - - - -	1,350	90 0 0
RECEIPTS.		
Sale of 7,200 bushels at \$1·25 per bushel - - -	9,000	600 0 0
Net profit - - - - -	3,290	219 6 8

The foregoing estimate is interesting since the yield per acre has been taken at the usual average of 15 bushels. A profit is shown of \$3,290, or 219*l.*, but no allowance has been made for the expenses of living and clothing, nor do the items of carting

and interest on capital appear in the statement of outlay. Taking this estimate as it stands, and reckoning the gold value of the dollar at 1s. 4d., the cost of production would be 1s. 0½d. per bushel.

It may be interesting to calculate from the above statements the estimated cost of growing an acre of wheat in the Republic, assuming the paper dollar to be of the gold value of 1s. 4d. This would work out as shown below, the yield per acre being taken as 15 bushels.

—	Estimate No. 1.	Estimate No. 2.	Estimate No. 3.
	<i>s.</i>	<i>s.</i>	<i>s.</i>
Labour - - -	2·03	No hired labour	1·66
Living - - -	2·68	—	—
Rent - - -	3·33	3·75	3·57
Seed - - -	2·78	1·67	2·33
Interest - - -	1·34	—	—
Depreciation - -	0·89	0·83	—
Twine and stacking -	1·25	1·11	—
Reaping and stacking -	—	—	5·00
	14·30	7·36	12·56
Carting at 1d. per bushel.	1·25	1·25	1·25
Threshing at 4d. per bushel.	5·00	5·00	5·00
Bags at 4½d. each -	2·42	2·42	2·42
	22·97	16·03	21·23

In the second of the above estimates no charge has been entered for labour as the farm is worked by the occupier with the aid of his family. This apparently means that the family is grown up and large, so that the cost of living would in this case be something more than the sum entered under Estimate No. 1, where the expenses of living relate to a young and not numerous family. It will be noted also that the item interest on capital is omitted. If allowance is made for these omissions, the cost of living being taken at 1½ times 2·68s. = 4·02s. and interest on capital at 1·34s., the total cost would be 21·39s.

The third estimate also fails to cover the items of living, interest, and depreciation. But the heavy charge for reaping may be probably due to the machinery being hired, instead of owned, so that interest and depreciation would be smaller charges than in the first two cases.

On the whole, it would appear from these estimates that the cost of growing wheat on virgin soil in the Argentine Republic ranges, under present conditions, from 21s. 5d. to 25s. per acre. Mr. Gastrell has stated that the cost would appear to be about 21s. per acre. Several authorities, quoted in Mr. Gastrell's report, placed the cost at from 13s. 4d. to 17s. 6d., exclusive of rent,

cost of living, and interest on capital; while a colonist farming in Santa Fé calculated the outlay per acre in 1893 at 14s. 2d. per acre, not including expenditure for seed, rent, living, carting, interest on capital, and depreciation. Another colonist in Santa Fé estimated the cost of production at 17s. 9d. per acre, excluding the charges for bags and carting. If allowance is made for the items omitted from these several statements, on the principle adopted in dealing with the estimates referred to above, it will be found that the cost per acre would again represent an outlay of from 21s. to 25s. per acre. It would appear, therefore, that the mean cost of producing and marketing wheat in the Argentine Republic under present conditions would be equivalent to a sum of about 23s. in gold. In some districts the amount would be slightly increased by a wheat tax, which, in Santa Fé, is actually about 6d. per acre on an average yield of 15 bushels.

The price obtained in September and October last for a quarter of wheat delivered at the railway station is said to have been from \$4.70 to \$5 per *fanega*, or roughly 12s. 6d. to 13s. 4d. a quarter. This price would represent on an average yield of 15 bushels a return of only 23s. 6d. to 25s. per acre, a sum barely sufficient to cover the outlay. It must be remembered, however, that the past harvest in the Argentine Republic is reported to have been exceptionally abundant, the yield per acre having been estimated at 20 bushels, or five bushels in excess of the average of previous seasons. This increased yield, though accompanied by an enhancement of the expenses of marketing and of other outgoings, appears to have left a fair margin of profit to producers. But, from the statements shown above, it will be seen that an all round price of 13s. 4d. per quarter would not pay producers in an ordinary season, and it would seem to be clear that, although the exceptional yield of the past season may have rendered it possible for Argentine wheat to be sold in this country without loss at 20s. or something less per quarter, it would not be profitable for the growers to continue to produce the cereal for sale at this price, other conditions remaining unchanged, unless the yield per acre approached that of the last harvest. It is expected, however, that with improved methods the average production on the rich soils of the Republic will be considerably higher than 20 bushels.

VIII.—PRODUCTION OF FOOD GRAINS IN INDIA.

The Board of Agriculture have received from the India Office a copy of a memorandum on the resources of British India, prepared by Mr. Geo. Watt, C.I.E., the reporter on economic products to the Government of India.

In this memorandum it is stated that the food producing capacity of India and the necessities of home consumption, are questions involved in the very greatest confusion and obscurity. The Famine Commission of 1878 endeavoured to deal with them, and although considerable progress has been made in the method of collection and publication of agricultural statistics, it is still impossible to speak with any degree of certainty on the food supply and the requirements of India. That this should be so will at once be apparent when the vast extent of the Indian Empire is borne in mind, in conjunction with two facts, viz., the very large tracts of the Empire administered by native princes, who furnish practically no returns regarding the agricultural condition of their States, and the extensive areas of the British provinces that have not as yet been cadastrally surveyed. So far as can be estimated, the area of actual cultivation, in the twelve months ended March 31, 1892, was 187,795,210 acres, and from about one eighth of that area two crops were obtained in the year. Of the cultivated area (including double cropping) 180,784,563 acres were devoted to food crops, and the estimated yield of food materials from that area, based on the figure of average acreage yield adopted by the Famine Commissioners, is put at 57,215,000 tons.

The area of British India is roughly about 699 million acres which supports a population of, say, $221\frac{1}{2}$ millions. A figure might be worked out (from the estimated production of 57,215,000 tons of food materials and the $221\frac{1}{2}$ millions of population) to express the supply available per head, and thus to show whether or not a natural surplus might be assumed to exist over and above the necessities of the population. But no such calculation could, it appears, be seriously advanced. It would ignore (even in the accurately surveyed areas of British India) many factors of vital importance. Among these may be mentioned:—(a.) The error incident to the adoption of any standard of yield as applicable to all food crops; (b) imports and exports, both internal and external; (c) wild food stuffs, which constitute a substantial source of supply, more particularly among the hill tribes; and (d) animal food materials—especially fish. In other words, it would be unsafe to assume that the people of India nowadays live exclusively upon the produce of their own fields, as it would be misleading to suppose that they

are entirely vegetarians. Precise returns cannot, therefore, be furnished as to the total food-supply of India, nor any portion of it, still less of the actual requirements of the people; but such information as is available on these subjects is relatively of value.

It would, it is urged, be contrary to all experience to maintain that the people of India were from year to year continuing to export a larger share of their agricultural produce than was consistent with their own advantage. The fallacy, for example, of their being supposed to export wheat and rice, and through the greed of money to be living more and more on inferior food stuffs, is completely exposed by the perfectly easily ascertained fact that it is not in food stuffs alone that India has for years past steadily augmented her supplies to foreign countries. On the contrary, the exports of food-grains have shown a very much lower rate of expansion than has been the case with any other group of products, *e.g.*, fibres, oil-seeds, &c. The following were the exports of grain (wheat, rice, pulse, gram, &c., &c.) to foreign countries during the eleven years to 1892-3:—

	Cwt.		
1882-83	-	-	46,556,000
1883-84	-	-	49,220,000
1884-85	-	-	39,217,000
1885-86	-	-	50,425,000
1886-87	-	-	51,009,000
1887-88	-	-	44,605,650
1888-89	-	-	42,416,000
1889-90	-	-	42,687,000
1890-91	-	-	50,149,000
1891-92	-	-	66,385,872
1892-93	-	-	44,900,430

Thus the exports of 1892-93 were actually less than those of 1882-83. The sudden expansion of 1891-92 is attributed to European conditions that created a most unusual demand for wheat, and the fact that India was able to respond, and to thus double her normal exports of that grain, is said to prove that the trade is a perfectly natural one, and one which cannot be regarded as draining away abnormally the food supply of the people. The production of wheat, cotton, oil seeds, or other Indian exports can be readily demonstrated as directly governed by the conditions of the European market. When favourable prices are anticipated, the area of production is at once increased. Mr. J. E. O'Connor speaking of the food production, says: "The area has increased in about the same ratio as the population, and the exports are as yet so absolutely insignificant, that their withdrawal from stock has no appreciable effect on the quantity available from the enormous area cultivated. If the exports should very largely increase hereafter — which,

however, does not at present seem to be probable,—we shall certainly find the area of cultivation to extend in direct ratio with the combined home and foreign demand.”

As regards the extent of possible increased production of food grains, it is observed that of the net surveyed area of British India (viz., 526,200,000 acres), the crops of the year 1891–92 were obtained from 187,800,000 acres, with 31,200,000 acres in current fallows, but two of the most important features of possible future development are :—(a) the fact (practically unknown to European agriculture) that India can and does obtain two or more crops a year from a large portion of her cultivated area ; and (b) that there exists in British India a culturable waste area of, roughly, 99,000,000 acres.

The total irrigated area of India, may be accepted as 27,600,000 acres. The extension of double cropping depends mainly upon the expansion of the region of artificial irrigation. This subject has recently been dealt with by Sir Edward Buck in a Resolution of the Government of India, Revenue and Agricultural Department, dated 27th November 1893. This Resolution which deals with only a portion of India, viz., 433 million acres (Bengal was not included), shows that, excluding the unculturable and forest lands, there are 270 million acres either cultivated or culturable ; that, of this area, only 28 million acres are irrigated, while 76 million acres are capable of being irrigated and with advantage. Of the 76 million acres of irrigable land, 43 millions are actually cultivated. Assuming that one third of the 43 million acres is irrigable from wells, which is somewhere near the truth, there are nearly 15 millions of cultivated acres in which wells ought to be constructed. In 1890–91, the Government advanced R. 854,900 to the cultivators to enable them to construct wells, and the result has been a net interest of 6 per cent. on the capital thus invested. The construction of canals is a work that must ordinarily be undertaken by the State, and the past decade has shown an increase of the canal irrigated area from 6,800,000 acres in 1881–82, to 9,664,000 in 1891–92. Without, therefore, taking into account the gradual improvement of agricultural methods at present taking place, and which may be expected from year to year to ultimately greatly increase the productiveness of India, the expansion of the area of irrigation cannot fail to enhance the yield of lands already cultivated and extend the area of actual cultivation.

According to the Resolution, good cultivation, with irrigation and manure, may in India, even on land originally poor, secure an outturn of 30 bushels of food crops to the acre, which is very much what the English acre produces of wheat under favourable circumstances. But the average outturn in India was estimated by the Famine Commissioners to be approximately not more than 12 bushels, and that average has been adopted in the calculation of 57,200,000 tons of food stuffs referred to above.

In dealing with the question of the increase of India's productiveness by the utilisation of the culturable waste lands, it is pointed out that the future food supply of India must of necessity be influenced, as it is at present, by the gradual utilisation of these lands, which are not likely to remain utterly neglected whilst the rest of India advances with the times. The cultivated area of India has been stated to bear to the culturable area a ratio of 3 to 2, that is to say, for every three acres cultivated there are two acres capable of being cultivated, but which have not as yet been required to meet the home necessities of India, or the demands of her foreign trade. As a general statement, this view of the position may be accepted, though not, strictly speaking, correct.

It is believed that future surveys will, in analysing the returns of Bengal and Assam, raise the total cultivated and fallow area for all British India to, say, 220 million, and reveal the culturable waste as 120 million acres. While it is admitted that the probable productiveness of the available waste lands is never likely to be of equal value with that at present under cultivation, it is considered safe to affirm that with the extension of measures of irrigation, more thorough and complete facilities of transport improvements in methods and materials of agriculture and the expansion of the area of cultivation [(a) in ascertained culturable waste, and (b) in regions for which no returns exist], the productiveness of India might easily be increased by at least 50 per cent.

IX.—EXPERIMENTS IN PLANTING POTATOES.

The *Bulletin de la Société Nationale d'Agriculture de France* contains a paper by M. Girard upon the results of a series of investigations as to the relative effects of planting cut and whole seed potatoes, and the influence of the weight of the seed upon the crop. The experiments were also designed to determine the effect of planting two or three very small entire tubers together. French growers have long been in the habit of utilising in this way tubers of less than average weight, and the practice should, *à priori*, yield satisfactory results.

The extraordinary productive power of small tubers, especially of very small tubers, has been demonstrated by M. Girard in numerous previous experiments, and cases are on record in which tubers weighing only a few grains have yielded 100 fold or even 190 fold in point of weight.

The experiments now reported upon by M. Girard extended over a period of five years, from 1889 to 1893 inclusive.

The object of the experiments was to compare the results obtained by planting entire tubers, a method which M. Girard has constantly recommended for the last 10 years, with those obtained from planting cut tubers and small tubers in groups. To make the comparison of utility an equal weight of seed was planted at each operation, with the exception of the cases where it was desired to compare the results obtained by planting whole tubers of average weight with those obtained from planting these tubers cut into two pieces.

Special measures were adopted to secure, as far as possible, uniform conditions throughout these investigations, and the experimental plots were so arranged as to reduce to a minimum the possibility of errors arising from differences in the nature and condition of the soil.

The experimental plot was divided into six parallel sections of equal area, and these were sub-divided lengthwise into six equal and parallel strips. Six methods of planting were tried on the first section, and repeated on each of the remaining sections.

The experiments of 1890 were vitiated by a mistake, and the results have therefore not been included. In 1891 the experiments were conducted with two kinds of potato, viz., Richter's Emperor and Athens. Of each of these varieties 100 tubers were planted in each of the six different methods of planting in six rows. At harvest, the number of tubers that had failed to grow was carefully noted, and the yield of each row was separately weighed. The same experimental method was applied in 1892 to two other varieties, Yellow Rose and Idaho.

The results, which have been calculated to the acre, of these two sets of experiments are shown in the following tables.

Experiment of 1891.

Weight of Seed.	Per-centage of Failures.	Yield per Acre.	Per-centage of Failures.	Yield per Acre.
	Imperator.		Athens.	
	%	Cwts.	%	Cwts.
Tubers of $3\frac{1}{2}$ oz. planted whole	2	311	3.6	278
" " cut into two portions - - -	0	234	1.2	223
Tubers of 7 oz. cut into two portions - - -	7	266	0	262
Tubers of $10\frac{1}{2}$ oz. cut into three portions - - -	12	189	9	200
Tubers of $1\frac{3}{4}$ oz. Two tubers planted together - -	1	294	0	277
Tubers of 1 oz. Three tubers planted together - -	0	217	0	249

Experiment of 1892.

Weight of Seed.	Yellow Rose.		Idaho.	
	%	Cwts.	%	Cwts.
Tubers of $3\frac{1}{2}$ oz. planted whole	2	100	0	144
" " cut into two portions - - -	5	81	1	112
Tubers of 7 oz. cut into two portions - - -	10	87	2	128
Tubers of $10\frac{1}{2}$ oz. cut into three portions - - -	7	76	10	117
Tubers of $1\frac{3}{4}$ oz. Two tubers planted together - -	5	96	8	106
Tubers of 1 oz. Three tubers planted together - -	4	87	6	100

Finally, in 1893, four other varieties were subjected to similar comparative experiments; the results, calculated to the acre, appear in the two tables below:—

Weight of Seed.	Idaho.		Blue Giant.	
	%	Cwts.	%	Cwts.
Tubers of $3\frac{1}{2}$ oz. planted whole	3	216	10.5	186
" " cut into two portions - - -	15	153	10.5	233
Tubers of 7 oz. cut into two portions - - -	4.5	188	15	238
Tubers of $10\frac{1}{2}$ oz. cut into three portions - - -	13.5	164	12	150
Tubers of $1\frac{3}{4}$ oz. Two tubers planted together - -	1.5	213	9	211
Tubers of 1 oz. Three tubers planted together - -	0	240	10.5	213

Weight of Seed.	Athens.		Imperator.	
	Per-centage of Failures.	Yield per Acre.	Per-centage of Failures.	Yield per Acre.
Tubers of $3\frac{1}{2}$ oz. planted whole	18	Cwts. 119	9	Cwts. 198
" " cut into two portions	42	34	21	119
Tubers of 7 oz. cut into two portions	27	67	28.5	146
Tubers of $10\frac{1}{2}$ oz. cut into three portions	10.50	140	42	98
Tubers of $1\frac{3}{4}$ oz. Two tubers planted together	7.5	84	0	236
Tubers of 1 oz. Three tubers planted together	9	97	0	177

If the yield obtained from the entire tubers weighing $3\frac{1}{2}$ oz. of each variety of potato used in these experiments be taken as a basis of comparison and represented as 100, the relative values of the six different systems of planting may be shown as follows :—

Weight of Seed.	1891.		1892.	
	Imperator.	Athens.	Yellow Rose.	Idaho.
Tubers of $3\frac{1}{2}$ oz. planted whole	100	100	100	100
" " cut into two portions	75	80	81	78
Tubers of 7 oz. cut into two portions	87	94	87	88
Tubers of $10\frac{1}{2}$ oz. cut into three portions	61	72	76	81
Tubers of $1\frac{3}{4}$ oz. Two tubers planted together	94	99	96	74
Tubers of 1 oz. Three tubers planted together	70	89	87	73

Weight of Seed.	1893.			
	Idaho.	Blue Giant.	Athens.	Imperator.
Tubers of $3\frac{1}{2}$ oz. planted whole	100	100	100	100
" " cut into two portions	70	125	29	60
Tubers of 7 oz. cut into two portions	86	128	56	73
Tubers of $10\frac{1}{2}$ oz. cut into three portions	76	80	117	49
Tubers of $1\frac{3}{4}$ oz. Two tubers planted together	98	113	70	119
Tubers of 1 oz. Three tubers planted together	111	114	81	88

From the mean of the total yields of the different varieties dealt with in the experiments of 1891, 1892, and 1893, as well as from the mean of the total number of cases in which the seed failed to germinate, the following table has been drawn up showing the proportions both of the yield of potatoes and of the per-centage of failure in respect of each of the six methods of planting :—

Weight of Seed.	Per-centage.	
	Weight of Crop.	Number of Failures.
Tubers of $3\frac{1}{2}$ oz. planted whole	100	6
" " cut into two portions	69.35	12
" 7 oz. " two "	82	10.5
" $10\frac{1}{2}$ oz. " three "	74	14.5
" $1\frac{3}{4}$ oz. Two tubers planted together	95.36	3.7
" 1 oz. Three " " "	89.12	3.7

M. Girard points out that on comparing these mean figures with the particular figures relating to each variety, the difference between the former and the extreme figures are so slight that the mean may be regarded as conveying in this instance a very fair idea of the actual facts.

He thinks, therefore, that the experiments have shown that—

1. The maximum crop is obtained by planting entire tubers of medium weight.

2. The crop is diminished about 30 per cent. if such tubers are cut into two portions.

3. The crop is diminished, with rare exceptions, about 20 per cent. by planting cut seed weighing $3\frac{1}{2}$ ozs. from whole tubers weighing 7 ozs. or $10\frac{1}{2}$ ozs.

4. If two or three small tubers, weighing in all $3\frac{1}{2}$ ozs., are planted together, the crop is on the average from 5 to 10 per cent. less than that obtained by planting whole tubers of medium weight.

According to M. Girard, it would, however, be a mistake to assume that these latter proportions are anything more than approximate. For the crop obtained from small tubers is in some cases 25 to 30 per cent. inferior to that obtained from medium-sized tubers, as was shown by the Gelbe Rose crop in 1892, and the Athens in 1893. On the other hand, it appears that under certain circumstances, especially during a dry season, the planting of small seed tubers may produce 15 to 20 per cent. more than the larger single tuber.

The results just stated might also have been deduced from the per-centage of failures of each of the different systems of planting. In the case of cut tubers this proportion varied from 12 to 15 per cent.; for tubers of medium size it was only 6 per cent.; while for small tubers the proportion of failures was less than 4 per cent.

Of the different systems of planting tested, in the case of five different varieties, (Richter's Imperator, Athens, Blue Giant, Idaho, Gelbe Rose) in the experiments recorded above, the most effective is undoubtedly that of planting entire tubers of medium weight, that is to say, of about $3\frac{1}{2}$ ozs. for those varieties which yield large crops. This is the method which M. Girard recommends should always be adopted, if possible, by the cultivator, although almost equally satisfactory results may be obtained by the next best method, which consists in planting together two tubers of about half the medium weight, or weighing about $1\frac{3}{4}$ oz. each. If, instead of two such tubers, three very small ones are placed together, a smaller yield is obtained.

The planting of cut seed should, in M. Girard's opinion, be regarded as a last resource, since it always results in a reduction of the normal yield by 20 to 30 per cent. During dry years especially, the results of cutting tubers may prove disastrous. In 1893 some of M. Girard's co-workers who adopted this method lost the whole of their crop, and the following example is given as a case in point.

In 1893 M. Girard planted half an acre of Blue Giant potatoes on the farm of Faisanderie, at Joinville-le-Pont. In the preceding year a well-known agriculturist had announced that magnificent results could be obtained by planting cut tubers of this variety. With the intention of showing the fallacy of this announcement, M. Girard planted a strip $4\frac{1}{2}$ yards wide and 63 yards long, in the middle of the half-acre piece, with slices of large tubers cut into four pieces in the approved manner. Of 798 plants set in this manner, only 38 grew, yielding a crop of only 101·2 lbs., or 14·3 cwts. per acre, the yield of the rest of the field, which had been planted with entire tubers of medium size, being 10·7 tons per acre.

X.—AGRICULTURAL CREDIT BANKS IN RUSSIA.

A report on Agriculture and Forestry, published by the Department of Agriculture of the Ministry of Crown Domains, St. Petersburg, contains some interesting particulars respecting the rural credit institutions established in Russia.

The idea of rendering material support to the peasant population by means of facilitating credit operations is stated to have been initiated in Russia in the beginning of the present century, by Count Arakcheev, who founded a loan bank for advancing sums to the peasants of Grouzino, one of his patrimonial estates, and put into it 10,000 roubles to form a permanent fund capital. This bank not only advanced loans applied for by borrowers, but, even without any such application, advanced sums, by order of the elder of the community (*volostnoi starshina*), for the purchase of horses and cows for such peasants as had a fewer number than was in conformity with the local regulations. At the same time the bank received deposits from the peasants. The Grouzinsk bank is still in existence. In this way was established in Russia, on a more or less solid foundation, the principle of opening up credit to the agricultural peasant class. The example set at Grouzino was not, however, followed for a long time.

It was only towards the end of the Forties that the Appanage Department, having at its disposal a considerable capital, accumulated in the course of many years from the surpluses of different peasant taxes and from the rent accounts of peasant colonies settled on land belonging to the Department, determined to devote a portion of this capital to the foundation of village banks. These banks were empowered to advance loans to, and receive deposits from, peasants residing on estates belonging to the Department. The interest on loans was fixed at 5 per cent. For each loan, the sanction of the peasant community (*mirskoi skhod*) was required, and the borrower was also bound to find a surety for each 5 roubles. Besides loans on personal surety, advances were made on mortgage of real property to the amount of two-thirds of its value. For losses on loans advanced on surety, the surety was responsible; for loans on mortgage of real property, the whole peasant commune which had certified the appraisement was responsible.

From returns made in 1883 it would appear that up to that date 85 village banks, with a floating capital of 1,030,000 roubles, had been opened on appanaged estates, chiefly in the northern governments.

Subsequently the Minister of Finance, whose Department had up to 1866 the control of all affairs relating to Government serfs,

followed the example set by the Appanage Department, and by means of a considerable capital that had in the course of many years accumulated from the same sources, founded peasant savings banks and peasant-aid-funds for the benefit of the peasant serfs.

The savings banks were founded with the object of encouraging the peasants to deposit their savings in a bank. The object of the peasant-aid-funds was to advance loans on easy terms to peasants in need. These objects being closely united, establishments of both kinds were opened simultaneously in the same *volosts*, or country districts. The turnover capital of the peasant-aid-funds was formed partly out of the capital placed at their disposal by the Ministry of Finance and partly out of the profits on the deposits made in the savings banks. Loans were advanced to individual householders, and to communities of the districts in which the bank was located. Loans ranging from one to 60 roubles were made to individual householders for a term limited to three years. The rate of interest was fixed at 6 per cent. Up to the year 1883, there had been opened in 28 governments 1,474 peasant-aid-funds, with a floating capital of 7,140,000 roubles.

These village banks, the banks for appanaged peasants, and the peasant-aid-funds for former Government serfs, do not appear to have worked in a satisfactory manner. Their comparative failure is attributed to several causes, the chief being the want of proper supervision, an imperfect knowledge of business matters on the part of the peasants, the unproductive use to which loans were frequently put, and the incautious advancement of money to insolvent borrowers.

Prior to the emancipation of the serfs, the attention of the Government was exclusively concentrated on opening up credit to small peasant householders and farmers residing on Government or appanaged lands. A few years after the emancipation, proposals were made for the extension of easy credit to the peasantry in general, as well as to small traders and manufacturers, with the object of supporting and developing rural industries and trades. The ideas of Schultze-Delitsch, who was then at the height of his popularity in Germany, had penetrated into Russia, and had been adopted with sympathy and zeal by the best representatives of the intelligent classes of that period. At the instigation of M. Loughinine, a landed proprietor in the Kostroma Government, the first Russian loan-deposit company was founded in 1865, and served as a model to all like companies that were afterwards opened.

At first, and for a while, the formation of loan-deposit companies advanced very slowly; but later, owing to the active part taken in their foundation by country councils and private individuals, who, either in the way of subscriptions or loans, contributed the sums necessary to form a capital fund, the new scheme was carried out on a constantly widening scale. Up to

the end of the year 1892 the statutes of 1,494 loan-deposit companies had received the necessary official sanction. The main provisions of these statutes are generally to the following effect:—

1. The floating capital of the company to be formed by means of the payments made by its members on confirmation of share, assigned upon the foundation of the company, at the rate of 50 to 200, and in exceptional cases, to 1,000 roubles.
2. The company to be empowered to effect the following operations:—
 - a. Acceptance of deposits from the very smallest sum, 25 kopecks, to such an amount as shall not exceed five times the rate of share allotted, in accordance with the statutes of the company, to a single individual or to a single establishment.
 - b. Advancement of loans exclusively to members of the company, if without guarantee, at the rate of $1\frac{1}{2}$ of payment on share; if with guarantee, at a rate not exceeding three times the share.
 - c. Raising of loans for increasing floating capital of the company.
3. Liabilities incurred by the company on deposits or loans not to exceed ten times the sum paid on shares and of reserve capital.
4. All liabilities incurred by obligations on the part of the company to be guaranteed by the share and reserve capitals, and by the property of members, on the basis of mutual surety; the liability of each member, both for himself and other defaulting members, to be limited to ten times the rate of his share.

Of the 1,494 companies whose statutes have at one time or another been officially sanctioned and confirmed, only about 840 are carrying on their operations at the present time. The other companies were either never started, or they suspended their operations after a short existence. The very partial development of loan deposit companies, and their small number in comparison with the population, is accounted for to a large extent by the ignorance of the people, and partly by the faulty principles on which the companies based their activity. They were organised on the fundamental principle that the floating capital of the company should be formed by means of the periodical payments made by members on their shares, and that all the members should be held mutually responsible for the operations of the company. The fulfilment of the first of these conditions was, by reason of the want of means, extremely irksome to many of the peasants who were in need of easy credit, and the obligatory mutual responsibility of all the members kept a large number of peasants from joining any of the companies.

Of late the question of establishing a healthier and sounder mode of affording easy credit to the peasant class has again come to the front, and a revision of the actual statutes of loan deposit companies has been commenced with the idea of enlarging their sphere of operations, and of rendering it easier for them to enjoy a large credit with the Imperial Bank, since the necessity of having recourse to private loans is irksome and costly.

To remove the inconveniences connected with loan deposit companies, and with the purpose of ensuring to the rural population the establishment of a loan institution, which should better correspond with the organisation of already existing village communities, the Government drew up, in 1883, a scheme for the establishment of village banks. At the same time a board of control, composed of persons who were most intimately acquainted with rural administration, was appointed to direct the affairs of such banks. It was proposed to open these banks in districts where, for one reason or another, the establishment of loan deposit companies was impracticable or impossible.

The normal statutes of these village banks provide that the fund capital shall be formed from sums granted by peasant communities or private individuals, and shall not amount to less than 300 roubles. The banks are empowered to receive deposits and to borrow loans for a sum not exceeding five times the capital fund. Loans of not more than 200 roubles per person, and for a term not exceeding one year, are advanced exclusively to peasants of those communities which founded the bank. The collection of loans not repaid by the fixed term is effected in the same order and way as debts due to a peasant community. The administration of a bank is entrusted to a committee of control, consisting of three members and a chairman, elected by the village assembly of the community which founded the bank. The inspection of the banks is entrusted to the village assembly and district and Government chancelleries, to which the banks are obliged to give each year a report of their operations.

From May 1886, when the village banks were first opened, to November 1889, the statutes of 184 such banks had been approved and sanctioned, with a fund capital of about 500,000 roubles.

Besides these village banks, there was established in 1883 a central Land Bank for the Peasantry, with the object of facilitating the purchase of land by peasants by means of voluntary agreement between proprietor and purchaser. It was found that the most practical way of facilitating the purchase of land was to advance the required sum for a long period to the intending purchaser, and to allow the gradual liquidation of the loan. The amount of the loan advanced is limited to 125 roubles to any individual member of the commune, and 150 roubles to a householder. The first of these two limits in the amount of a loan advanced is applied to those places where the custom of

commune possession of land widely prevails ; the second is applied to places where the inventory system prevails.

In all technical points, the Bank for the Peasantry carries on its operations on the ordinary bases of mortgage banks. The bank obtains the means of advancing loans by the issue of $5\frac{1}{2}$ per cent. mortgage bonds, which are guaranteed by the estates mortgaged and by the general resources of the Government. For all loans advanced, the borrower is obliged to pay every six months: *a.*, $2\frac{3}{4}$ per cent. interest; *b.*, 1 per cent. liquidation on loans for $24\frac{1}{2}$ years, and $\frac{1}{2}$ per cent. on loans for $34\frac{1}{2}$ years; *c.*, $\frac{1}{2}$ per cent. in favour of bank and reserve capital; in all $8\frac{1}{2}$ per cent. yearly on loans for $24\frac{1}{2}$ years, and $7\frac{1}{2}$ per cent. on loans for $34\frac{1}{2}$ years. Loans are advanced in cash from the funds derived from the sale of the bank's mortgage bonds. In 1893 the $5\frac{1}{2}$ per cent. mortgage bonds of the Bank for the Peasantry were converted into $4\frac{1}{2}$, with a corresponding abatement of the interest paid by borrowers.

Further particulars as to the progress of this bank is contained in a Report dated 16th August 1894, transmitted to the Foreign Office by Mr. T. Michell, Her Majesty's Consul General at St. Petersburg. In this report it is stated that the Peasants' Land Bank is yearly contracting its operations, owing to the growing inability of the peasantry to fulfil the pecuniary obligations contracted by them towards the bank. The quantity of land purchased with the aid of the bank has been gradually diminishing. In 1885 the quantity of land so acquired by the peasantry amounted to 318,002 dessiatines (795,005 acres); in 1886 to 294,688 dessiatines (736,720 acres), and in 1892 to not more than 148,018 dessiatines (370,045 acres). In the course of 10 years the bank advanced 65,100,000 r. (6,500,000*l.*) for the purchase of land and the area of land purchased amounted to 1,890,349 dessiatines (4,725,872 acres), the participating purchasers being 268,499 heads of families, consisting of 866,698 adult males. By December 1, 1893, the value of the lands which have reverted to the bank by non-payment of the advances made by it for their purchase amounted to 642,039*l.*

During the first three years of its existence the bank advanced about 3,500,000*l.* for the purchase of land; in 1887 the advances fell to 750,000*l.*, in 1888 to 500,000*l.*, diminishing during the last three years to 450,000*l.* yearly. In order to make the payment of interest on its advances to the peasantry less onerous, the bank during the past year converted its $5\frac{1}{2}$ per cent. bonds into those of $4\frac{1}{2}$ per cent.

XI.—POULTRY REARING AND FATTENING IN SUSSEX.

An interesting report on the poultry industry of the Heathfield district of Sussex has been presented to the Royal Commission on Agriculture by Mr. R. H. Rew, Assistant Commissioner.

The Heathfield district of Sussex is well wooded and hilly, with deep valleys between the hills, while the land is naturally light and sandy. It is suggested that these physical characteristics, the sandy soil and the sheltered hollows, may have favoured the rearing of early chickens, and thus conduced to the establishment of the industry for which the district has gained some reputation. Long before the introduction of railways, the rearing and fattening of poultry in this neighbourhood was carried on to such an extent as to maintain a regular service of four-horse waggons running two or three times a week to carry the dead poultry to London. The development of the trade appears to have been progressive. Ten years ago the consignments of dead poultry from Heathfield station were of the estimated value of 60,000*l.* per annum, as compared with a despatch to-day representing an annual value of about 140,000*l.* The increasing output of poultry in recent years is attributed partly to the circumstance that farmers have "gone in for it because other things don't pay," and partly to the arrival within the last seven years of considerable numbers of live fowls from Ireland for fattening in the district.

The rearing and the fattening of the chickens are, it appears, two absolutely distinct branches. Usually the chickens are reared by one man and fattened by another. Rearing is carried on to some extent by almost every one in the district, from the large farmer to the cottager. The "fatters" or "higglers" collect chickens two or three times a week from the farms and cottages. They usually call on each customer about once a fortnight and purchase, at the market price of the day, all the chickens which are sufficiently forward for their purpose.

It seems that little or no attempt is made to keep a pure breed of fowls in the district. Most of the birds are cross-bred, though the original strain was probably the Dorking. Some rearers keep Brahma-Dorkings. The old Sussex fowl, the high qualities of which as a table bird are alleged to have gained for Sussex its reputation for good chickens in the London market, is dying out. Recently, however, more attention has been devoted to the maintenance of a good class of fowls; and the cottagers are said to show considerable keenness when investing in a "rooster" suitable to maintain their stock, and to guard against the evil of in-breeding. A cottager with a dozen hens

will, according to Mr. Rew, display as much concern in the selection of a suitable rooster as the owner of a pedigree herd in the purchase of a new bull.

One of the largest poultry-rearing farms in the district is owned by an experienced farmer who has been rearing poultry for the last 10 years. His farm consists of 200 acres, of which about two-thirds are grass and 8 acres of hops. The stock on the farm at the time of the Assistant Commissioner's visit consisted of 48 head of cattle, including 10 cows, 38 young stock and calves, and 7 horses. Oats, grown for food for the fowls, form the main cereal crop. Two of the fields which were laid down to pasture about eight years ago have now good turf, although they received practically no dressing but fowl manure. About 8,000 chickens are reared on this farm each year. Mr. Rew saw 50 coops, each covering a hen and brood, set out in a pasture field of 12 acres. The chickens are fed four times a day on oatmeal mixed with milk while in the coops, and three times a day after they leave the hen. The larger fowls have ground oats twice a day, and whole wheat once a day. The class of fowls kept is the Brahma-Dorking cross. Several fine breeds, including Orpingtons, have been tried without success on this farm. Rearing chickens go over the farm field by field in rotation. On leaving the coops the chickens are put into movable wooden houses or "night-hutches," which permit them to range freely over the field during the day, and in which they are shut up at night, or for shelter during the day. In addition to these hutches, two or three larger hen-houses mounted on wheels are kept for the sitting hens; but these are usually accommodated in fixed houses. The occupier does not believe in poultry-farming pure and simple, but thinks that fowls must be kept on a farm as a branch of the business and not as the sole product of the land.

Mr. Rew points out that the success of rearing depends so absolutely on individual care and unremitting attention, that there is naturally some difficulty in getting efficient labour. This difficulty has been solved on the farm in question by an adoption of the principle of profit-sharing analogous to that adopted by flock-owners with their shepherds. The men who attend to the rearing of the chickens receive a regular wage and a commission averaging 9*d.* a dozen upon all chickens which they successfully rear.

On another farm the chickens are fed upon ground oats and water four times a day while in the coops. Subsequently they are fed three times a day and receive maize as well as oats. The first broods appear in December, and fattening begins about the end of March. The chickens are not allowed access to water as they are said to thrive better without it. The practice on this farm is to rear cocks for stock and buy pullets, while most farmers buy cocks and save pullets. It is stated that ground oats are universally used both for rearing and fattening

throughout the district. Barley meal and maize are considered "too heating."

As a striking instance of what can be done by means of poultry, attention is directed to the case of a young man 33 years of age who started life as a labourer. He took to rearing a few fowls, gradually increasing his stock by thrift and hard work, and then started fattening. Last year he was able to purchase a holding of 27 acres. He rears 600 chickens himself, and collects once a week for his fattening shed. The stock on his small holding, which is now all grass, consists of five cows, a horse, and a few sheep. On a still smaller holding of 19 acres, all grass, 600 chickens are reared annually. Five cows are kept, and butter is made. The chicken industry on this small holding is managed mainly by the occupier's wife and son who maintain that rearing pays them better than fattening, the margin of profit in the fattening business being small owing to the competition for chickens among the higglers. The cost of rearing a chicken on this holding is reckoned at 1s., while the prices realised range from 1s. 8d. to 3s. 6d. for each bird, the majority fetching the lower price.

Most of the labourers and cottagers in the Heathfield district keep a few fowls and rear chickens for the higglers. A typical example is furnished of the way in which a man can make a start. A labourer's wages were 15s. a week, out of which he paid 2s. a week for his cottage and garden. His employer lent him 24 hens, 2 cocks, and a movable house, and allowed the fowls to run over the fields. From this stock, chickens were reared all through the year and sold at prices ranging from 1s. 8d. to 3s. 6d. each, a large number, by good management, being ready in April when prices are high. The outlay for oats and maize amounted to 17l.; but by the end of the year a clear profit had been made of 20l., and after returning the 26 stock fowls there were 6 pullets left to go on with. This, it is pointed out, is a fair instance of the way in which, with intelligence and thrift on the part of the man and a little generosity on the part of his employer, the labourer may obtain what is really a start in life towards independence.

Many farmers have pointed out that cows and chickens are complementary to each other, as the chickens thrive upon, and indeed require, skim milk. Some rearers even find it necessary to buy up skim milk in considerable quantities. It appears that several attempts have been made to establish "poultry farms" exclusively devoted to poultry, but that they have all been given up after more or less perseverance. Practical farmers who rear large numbers of chickens insist that only in connexion with, and as a branch of farming, would many fowls pay. It is said that no poultry farm lasts more than three or four years.

Fattening establishments vary considerably in size. One of the largest in the Heathfield district turns out about 100 dozen

chickens per week, or more than 60,000 a year. If the "fatter" or "higgler" has a large business, he may collect every day of the week from different parts of the district; but more commonly he makes his journeys on one or more fixed days each week. Chickens are taken when three or four months old, the price varying according to the season. Competition amongst higglers secures to rearers the full market prices of the day. The chickens are taken in "tops" or crates to the fattening yard, and at once placed in pens. These are light wooden cages supported upon a stage about four feet above the ground with a feeding trough hung in front of the pens. Strict cleanliness and a plentiful use of lime-wash and carbolic are considered essential. After being placed in the fattening pens, the chickens do not again touch ground, being taken out only to be killed. The period of fattening varies somewhat, some chickens being "better doers" than others; but it is seldom less than three or four weeks. The chickens are fed twice a day on ground oats mixed with skim milk enriched with melted beef- or mutton-fat. For the first half of the fattening period the chickens feed naturally, but during the latter half they are "crammed." This operation is now almost invariably done by a cramming machine. Every fatter has a certain amount of grass land on which to make use of the manure from the fattening pens. The coarse feathers are also used as manure. A few cows are usually kept to supply skim milk for fattening.

Killing takes place usually three times a week. The killed chickens are plucked and then "stuffed" by women and children, who are generally paid 6d. a dozen. When stuffed, the carcasses are placed in a row in a kind of trough with a heavy weight along their breasts to give them a square compact appearance. Subsequently they are closely packed in "peds" and collected three times a week by carriers, who collect, convey, and deliver to market for 1s. per dozen, including freightage by rail. This van is generally filled, and often insufficient to take the whole quantity. The great bulk goes to Leadenhall and Central Markets, London; but some to Brighton, Hastings, Worthing, Chichester, and other southern towns.

Chickens from the Heathfield district are, it seems, generally known in the London market as "Surrey fowls." Only a few "Surrey" fowls, properly so-called, appear in the market.

Caponising appears to be very little practised. Ducks and turkeys are fattened to some extent in the district, the latter rather largely for the Christmas market.

The one drawback to the chicken-rearing industry is said to be the risk of losses by disease or by natural enemies. But on the whole, Mr. Rew is of opinion that poultry rearing has been an alleviation of agricultural depression to many farmers of the Heathfield district. The most noteworthy results of the industry are to be found in the case of small holders who, it appears, get the highest return. The Rector of Heathfield has

expressed the opinion that three acres and a cow, plus poultry, or better, six acres and two cows, with poultry, will provide a decent living.

Discussing the question whether the system of rearing and fattening poultry carried on so successfully in the Heathfield district might be equally well adopted in other parts of the country, Mr. Rew points out that the latter branch of the industry is a distinct business, and that chickens fattened in the district visited by him have a long-standing reputation in the market. Singularly enough, however, enterprise in rearing does not keep pace with the demand of the fatteners, and as Mr. Rew observes, it is difficult on the face of it to understand, for instance, why Irish farmers and cottagers should be able to supply a market to which English farmers are so much nearer. English chickens are said to be much preferred to Irish; but chickens are required which will come in early in the spring, and it is in this requirement that the difficulty would seem to lie.

In the appendix to Mr. Rew's report, there is a paper by Mr. W. A. Haviland, Secretary of the Hurstmonceux Farmers' Club, who has devoted much attention to the subject of poultry rearing. According to the observations of this authority, the greatest difficulty, and one of the most expensive items connected with poultry rearing on farms, is the question of housing. Wooden houses are said to be as good as any, and it is easier to make these portable: portability being an essential feature, since poultry will not do well in some places, or they will do well enough for a time until the ground gets foul, when the houses must be moved. A very good flooring for poultry houses can, it appears, be made of clay and cinders rammed down hard.

The different breeds of ordinary fowls are divided by Mr. Haviland into two classes, first, those which will sit and hatch their own eggs; and, second, those which do not do so or rather which cannot be trusted to do so. The former class comprises the Brahma, the Cochin, Dorkings, Leghorns, Spanish; whilst in the second class Minorcas, Hamburgs, and Houdans are mentioned. So far as the production of eggs is concerned, the latter varieties are alleged to give the best satisfaction, the Minorca and the Leghorn being especially recommended. Dorkings are reputed to be the best table birds, but the delicacy of the chickens when young is said to render a cross with some of the hardier breeds advisable. Game fowls and Houdans are also very good table birds, the latter being excellent layers.

Although fowls do not require very much attention if allowed their liberty, it is insisted that what attention is necessary must be given regularly and well. The houses must be kept clean, and the birds must have free access to good water. Regularity in feeding is also a point to which care must be directed. Laying hens apparently require two meals a day. The morning meal should be of soft food, preferably ground oats mixed with

a little water; but if this is not available, barleymeal or a mixture of barleymeal and maizemeal would be the best substitute. It is considered most important that the food should not be wet and sloppy, but well mixed up and as dry as possible without any of the meal appearing white and dusty. The afternoon meal should consist of whole corn, such as maize, barley, buckwheat, &c., as this will last the fowls longer through the night than the ground meal, but maize should be given much more sparingly than other corn. Boiled vegetables and scraps of meat are said to push laying hens on wonderfully, especially during winter. In the case of young chickens, it is recommended that at least three or four meals a day should be provided, of which the first should always consist of soft food and the last of whole grain. No more food should be given than what the fowls will clear up eagerly, and no food should be left on the ground.

To insure fertility in the eggs, Mr. Haviland thinks that not more than eight hens should be allowed to each cock. The hens apparently always do best when they sit away by themselves, and it is said to be a good practice if it can be managed to let the hen choose her own nest and sit away. Several sitting hens should not be allowed to run together when feeding, as they are very quarrelsome during the brooding period, and after fighting will not return to their eggs for some time.

As regards incubation, it seems that all that is necessary for the hatching of a fertile fresh egg is that it should be kept for 20 or 21 days in a damp temperature of from 103° to 104° Fahrenheit, the egg being periodically turned; artificial hatchers or incubators can therefore be used with very fair success. The operation requires knowledge and care, but with these it can be made very successful. Rearing up chickens artificially is said to involve so much labour and attention, except in very favourable weather, and is so often attended with failure, that it can hardly be recommended.

It is regarded of the greatest importance with laying hens that the eggs should be gathered every night, as not only are the hens thus less likely to become broody, but by never selling a stale egg the produce commands a much higher price in the market.

Statements have been made that a hen will lay on an average 200 eggs a year, and that some will lay as many as 250; but Mr. Haviland thinks that unless one has a very excellent laying strain, 140 will be as many as can be reckoned on all round where many hens are kept. Estimating these 140 eggs at 1s. per dozen on the average, the gross receipts for each hen would be 11s. 8d., against which must be placed the cost of good housing, depreciation, and labour. A laying hen running about free upon a farm, if the feeding be properly managed, ought not, it is maintained, to cost in this respect more than 1d. a week or 4s. 4d. a year, thus leaving 7s. 4d. per head to

pay for housing, depreciation, and labour, which latter item should not be very great.

Fowls are said not to stench the land at all for cattle or sheep. They do an immense amount of good in picking up grubs and insects, and also in spreading horse dung, ant hills, &c.; in fact, in spring and summer, if not kept too thick, they will almost support themselves. They should not, of course, be allowed in standing corn or mowing grass, but they can be easily kept from these by a 3-ft. wire netting run along the bottom of the fence.

Mr. Haviland states that farmers with, say, 150 to 300 or 400 acres of land, can make some 30*l.* to 60*l.* net profit per year with comparatively very little outlay by keeping laying hens and looking after them well.

XII.—REPORTS ON FOREIGN CROPS.

CROPS IN THE UNITED STATES.

The October report of the Statistician of the Department of Agriculture of the United States contains the preliminary estimates of the results of the past harvest in that country. The returns are stated to have indicated an average yield per acre of wheat of about 13·1 bushels. The estimated area under the crop, as reported by the Statistician in June last, appears to have been 33,000,000 acres, so that a yield of 13·1 bushels per acre would represent a total production of 432,300,000 bushels, as compared with a yield of 396,131,725 bushels last year.

The yield per acre is reported to have ranged from 3·4 bushels in South Dakota to 19·4 bushels in Indiana. The very poor out-turn in South Dakota, as well as in Nebraska, where the average production per acre was returned as 6·5 bushels, is attributed to the effects of drought. On the other hand, in some of the States the yield is said to have been greater than that of the phenomenal crop of 1891.

The condition of maize was returned in October as 64·2 against 63·4 in the previous month. The indicated yield per acre is stated in the November report of the Statistician to have been 19·7 bushels harvested from an estimated area of 60,500,000 acres only, as 15,500,000 acres are reported to have been abandoned except for fodder, &c. From these estimates, the crop would appear to have amounted to a total production of 1,191,850,000 bushels, against 1,619,496,131 bushels in 1893. This is the lowest yield recorded since 1881.

The average yield per acre of oats, as reported in October was 24·5 bushels on an estimated acreage of 27,027,500 acres. These figures would indicate a total yield of 662,173,750 bushels, compared with a production of 638,854,850 bushels last year. The returns as to the quality of this grain are stated to represent a general average of 90·5.

Rye has been harvested from an estimated acreage of 1,942,676 acres; the average yield is reported to have been 13·7 bushels per acre, so that the total production of this cereal in the harvest of 1894 would appear to have been 26,614,661 bushels.

According to the June report of the Statistician, the area sown with barley was about 3,172,000 acres. The yield per acre is stated to have been 19·3 bushels, so that the total production works out to 61,219,600 bushels. In the previous year a crop of 69,869,500 bushels was obtained from an area of 3,220,371 acres. The general average as to quality this season is returned as 90·2. While drought was the chief cause of the light yield;

late seeding, smut, and damage by grasshoppers and other insects, are mentioned as causes of injury in a few localities.

It appears that the present season has been unfavourable to the potato crop in the United States. In July, the condition was 92·3. This fell to 74 in August and again to 62·4 in September. A slight recovery, however, is reported to have taken place in October, when the condition was put at 64·3, as compared with 71·2 at the same period last year. The yield per acre is shown in the November report of the Statistician as 62·3 bushels, making a total production of 170,577,400 bushels from an area of 2,738,000 acres. In the previous year the total yield was 183,034,203 bushels.

Hay is stated to have yielded an average of 1·15 tons per acre. The hay acreage has been estimated at 45,843,000 acres, so that the total yield of this crop would appear from these figures to have been about 52,719,450 tons, while in the previous season it was 65,766,158 tons.

The average condition of apples in November is reported to have been 41·7 as compared with 40·8 in the month of September. The crop is likely to be a very poor one.

The condition of peaches stood at 21·1 in September, a decline of over one point from the previous month. On the Atlantic coast, south of Pennsylvania and New Jersey, conditions are said to have indicated a practical failure of the peach crop, and the same may be said of the States lying in the Piedmont region and of the Western States generally.

In his September report, the Statistician states that the reports as to the number of stock hogs for fattening showed, as a general average for the entire country, a reduction of 10 per cent. as compared with last year.

CROPS AND LIVE STOCK IN MANITOBA.

The statistics of the estimated acreage devoted to the cultivation of the principal crops in Manitoba in 1894 were given in detail in the first number of this Journal. Particulars of the estimated yield of cereals, flax, and hay have since been published in the August bulletin of the Department of Agriculture and Immigration at Winnipeg.

The estimated total production of wheat is 15,761,868 bushels as compared with 15,615,923 bushels in 1893. Oats are calculated to have yielded a crop of 12,197,772 bushels, while the yield of barley is estimated to have amounted to 2,182,520 bushels. In the previous season, the estimated production of these two cereals was 9,823,935 bushels, and 2,547,652 bushels respectively. The yield of flax in 1894 is estimated to have been 282,480 bushels.

The hay crop, both prairie hay and cultivated grasses, is said to have been light this season, owing to deficient rainfall.

Roots and potatoes are reported to have been fairly good throughout the province.

The numbers of live stock in the province, according to the August report, were 88,689 horses, 183,966 cattle, 35,430 sheep, and 68,367 hogs.

Farmers are said to be giving special attention to dairying.

CROPS IN AUSTRIA.

The *Wiener Landwirthschaftliche Zeitung*, quoting the October official report of the Austrian Ministry of Agriculture, states that cold rainy weather was experienced in the period between September 12th and the middle of October. Snow had fallen in some districts, and had interfered with the harvesting of the crops in some of the mountainous localities. On the whole, however, the yield of all kinds of cereals is said to exceed the average. The quality of the grain is said to be good.

The harvesting of potatoes has been delayed by the rains. Disease affected the crop more or less in most districts, but, nevertheless, the yield was expected to prove satisfactory.

Sowing operations for 1895 were, to a large extent, completed before the heavy rains set in. But it is feared that the soddened condition of the soil will severely affect the germination of the seed.

CROPS IN DENMARK.

According to the *Ugeskrift for Landmaend*, harvesting operations in Denmark were seriously impeded in the month of September by heavy showers; the yield of grain is reported, however, to have been generally satisfactory, except in some of the low-lying districts.

Root crops appear to have yielded well, notwithstanding the heavy rainfall. The potato crop has been less satisfactory in some districts, but the tubers are fairly free from disease.

CROPS IN FRANCE.

The Board have received from the French Ministry of Agriculture, copies of the *Journal Officiel* of September 18th and October 4th, which contain the preliminary estimates of the yields of the principal cereals in France in the harvest of 1894.

The official figures of the acreage and production, converted into English equivalents, are shown in the following table,

together with the final estimates of the crops of the previous year for purposes of comparison :—

—			1894.	1893.	1894.	1893.
			Acres.	Acres.	Bushels.	Bushels.
Wheat -	-	-	17,212,800	17,468,457	332,757,647	268,928,220
Barley -	-	-	2,319,332	2,093,660	54,813,396	33,662,747
Oats -	-	-	9,517,991	9,490,955	270,337,325	172,044,191
Rye -	-	-	3,866,829	3,779,403	74,102,979	61,918,089

CROPS IN GERMANY.

The latest official report received by the Board on the condition of crops in Germany is dated October 22nd last, and refers only to Prussia. A primary estimate of the production of wheat in that Kingdom shows winter wheat to have yielded about 25·1 bushels per acre, while the yield of summer wheat is calculated at 24·4 bushels per acre. In the previous year the yields of these grains were 27 bushels and 21·9 bushels per acre, respectively. From these figures it would appear that the crop of this year will be inferior to that harvested in 1893, for although an increase is recorded in the production of spring wheat, there has been a decline in that of the winter-sown grain, and the area under the latter is 11 to 12 times greater than the surface sown with spring wheat.

Summer barley is estimated to have yielded 32·3 bushels per acre as compared with 27 bushels last year.

The quality of both wheat and barley is said to have been seriously deteriorated by weeds and damp. In the western provinces the quality of the grain appears to have been so inferior that large quantities have been set aside as unsaleable, except for feeding to stock.

At the date of the report, no estimate could be furnished of the yield of rye, as threshing operations had been delayed by the lateness of the harvest.

Potatoes gave prospects of a crop below the average, both in quality and quantity. In heavy lands considerable quantities of the tubers appear to have rotted owing to the heavy rains. Some districts report from 50 to 80 per cent. of the crop as diseased.

Sowings for 1895 were proceeding without much interruption, but, in a few districts, continued wet weather delayed the sowing of winter grain.

CROPS IN ITALY.

The official preliminary forecast of the yield of wheat, barley, and oats in Italy in the harvest of 1894 has been published in the *Bollettino di Notizie Agrarie* for August.

Wheat is estimated to have yielded 119,167,000 bushels as compared with a crop in 1893 of 131,048,000 bushels : a decrease of nearly twelve million bushels. Barley, on the other hand, is reported to have furnished a crop exceeding that of last year by 150,000 bushels, the estimates being 7,801,000 bushels and 7,679,000 bushels respectively. The total production of oats is estimated to have been 15,335,000 bushels this season, whereas in 1893 the crop was 17,737,000 bushels.

The latest official statements are to the effect that autumn sowing had proceeded satisfactorily, and reports from most districts indicated that germination had taken place under the best conditions except in the Marches and Umbria, where the rainfall had been deficient.

CROPS IN THE NETHERLANDS.

According to the *Landbouw Weekblad*, the recent official reports as to the results of the harvest in the Netherlands indicate that the yields of cereals and roots have turned out far from satisfactory. Heavy rains and hailstorms during the month of August seriously injured the crops in many districts. Large areas of wheat and other grains were laid, and the plants sprouted. Considerable quantities of flax rotted in the fields, and the pea crop turned out for the most part a complete failure.

The out-turn of roots is reported to have been poor both in quality and quantity. Potatoes were affected with disease in many localities.

The hay crop, on the other hand, appears to have been very satisfactory ; but in many districts the hay was rendered worthless by floods.

CROPS IN ROUMANIA.

The preliminary official estimates of the yield of the principal cereal crops in 1894 in Roumania have recently been published by the Minister of Agriculture of that Kingdom.

The estimated acreage and total production of wheat, barley, oats, and rye in the last harvest, and in 1893 are shown below :—

—				1894.	1893.	1894.	1893.
				Acres.	Acres.	Bushels.	Bushels.
Wheat	-	-		3,441,000	3,174,000	42,255,000	58,257,000
Barley	-	-		395,000	353,000	5,593,000	7,464,000
Rye	-	-		1,382,000	1,462,000	16,391,000	34,545,000
Oats	-	-		649,000	614,000	9,714,000	14,804,000

It will be observed that the area sown with wheat, barley, and oats this year was larger than that devoted to these crops in 1893; but in spite of the increased area there was a considerable diminution in the production of each of these grains.

The yield per acre of wheat and barley is stated to have been 12·3 bushels and 14·2 bushels respectively, as compared with 18·4 bushels and 21·1 bushels in 1893. In the case of rye, the production per acre is estimated to have been just half of what it was in 1893; while the yield per acre of oats in 1894 is calculated to have been 15 bushels only, or nine bushels less than the production per acre in 1893.

CROPS IN SWEDEN.

In a despatch recently received from Mr. M. S. Constable, Her Majesty's Consul at Stockholm, referring to the Swedish harvest of 1894, it is stated that the cereal crops this year have been fully up to the average. Straw was plentiful and of good quality; the yield of wheat was considerably above, but that of rye somewhat below, the average. The hay crop from permanent pastures is said to have been good and well got in. The potato crop was poor and damaged in Götaland, it was better in Svealand, and very good over nearly the whole of Norrland. Root crops appear to have been quite up to the average.

XIII.—INJURIOUS INSECTS AND FUNGI.

RUST OR MILDEW ON WHEAT PLANTS.

From many reports received by the Board of Agriculture from various parts of the country it appears that rust or mildew was by no means unusually prevalent on wheat plants in the spring and summer of 1894, and, notwithstanding the variable nature of the weather, exemplified by the abnormally severe frost of May 21st, and the quantity of rain that fell during the season in most districts, only a comparatively small amount of injury was caused to the corn and straw by this fungoid disorder. It will be remembered that in the Report on Rust or Mildew on Wheat Plants (C.—7018), published by the Board in 1893, it was stated, as the opinion of many wheat growers, that rust was always much worse in wet seasons and when there had been late and severe spring frosts, like the memorable frost of June 13th, 1892. But the experiences of 1894, coupled with the fact that, in foreign countries, where the spring and summer seasons are hot and dry, rust is far more harmful than in Great Britain, would seem to be antagonistic to this theory.

The fitfulness of the appearances of rust in this country may possibly be the reason of the apparent indifference of wheat growers in respect of this fungoid disease. There would also appear to be some misapprehension generally as to the amount of actual injury caused by rust to the quantity and quality of the corn and straw crop. It is very frequently not realised that rust, in its yellow form at first, and later in the black phase, upon the flag, stalk, and sheath of the wheat plant, occasions serious harm. The fungus lives upon the host plant, from which it absorbs the sap for its own sustenance, thereby cutting off supplies of food which should serve for the full development of the grain. Besides, it chokes up the stomata, hindering or preventing transpiration and respiration, and sets up unhealthy conditions. Though it does not attack the grain directly, the effect of its action upon the plants is to lessen the number of grains formed, and in many cases to cause those formed to be small, misshapen, shrivelled, and light. The straw, also, is discoloured and rendered very brittle, and unfit for anything but rough litter.

It has been observed that rust is more frequently found upon the flag than upon the sheathing leaves and the stems. This is explained by the fact that the tissues of the flag are softer and not so glaucous. The fungus also spreads to the ears both on the outside and the inside of the glumes, but not to the grain.

But its indirect influence upon the grain, to whose production the whole energy of the plant is directed, is very injurious, as has been shown above.

In view of the severe attacks of rust in Australia, and the consequent material losses to farmers, the Departments of Agriculture of New South Wales, South Australia, Victoria, and Queensland have done all in their power since 1890 to obtain and spread information upon the subject. Conferences have been held alternately in the capitals of these Colonies for the discussion of suggestions as to experiments, and for the consideration of reports upon the results of the various experiments undertaken.

An account of the proceedings of the first three Conferences was given in the report issued by the Board in 1893. The fourth Conference was held at Brisbane in March 1894, when a final report on the work of the Conferences was presented. In giving an epitome of this report it will be useful to recapitulate the main heads of inquiry included in the comprehensive scheme of experiments, scientific and practical, carried out in Australia.

The chief subjects covered by this experimental work have been the following:—1, the relation of applied manures to the rust contagion; 2, effect of fungicides in spraying; 3, effect of cultivation; 4, the character of flag or straw of wheats as influencing the spread of the disease; 5, the extent to which rust spores adhere to seed wheat; 6, microscopical, chemical, milling, and baking tests of wheats, made with the purpose of determining the relation of rust resistance to known qualities; 7, influence of insects as carriers of rust spores; 8, determination of the particular kind of *Puccinia* affecting crops in different districts; 9, effect (upon rust) of different times and modes of sowing wheat; 10, the creation of rust-resistant sorts by cross fertilisation and selection; 11, the relative value of different varieties of wheat.

With regard to the first of these points of investigation, viz., "the effect of fungicides in spraying," the difficulty of application has proved a serious drawback, and spraying is not included in the "Recommendations for the Immediate Attention of Farmers" issued by the Conference; not, it is presumed, because the fungicides are inoperative, but owing to the great difficulty in applying them to wheat crops.

The main recommendations of the Conference are to the effect that, whatever other measures may be adopted by farmers with the effect of preventing the appearance of rust or of arresting its further spread, the following practices cannot well safely be ignored, viz. :—

1. Early sowing and the cultivation of early ripening sorts.
2. Harvesting rust-infected crops in the early or "dough stage."
3. The growth of sorts which local experiences have shown to be rust-resisting or rust-escaping.

4. The growth of wheat after fallowing or after crops of a different order, agreeable to the true principles of rotation.
5. Thin seeding, with due regard to varieties and local conditions of soil and climate.

The most important of these recommendations is the third, respecting the cultivation of rust-resisting or rust-escaping varieties of wheat. The Conference believed that no such cereal as perfectly rust-proof wheat has yet been discovered, but the experiments conducted in the Colonies have shown that by importing different varieties from countries outside Australia, and by carefully selecting and crossing them within the Colonies, certain kinds have been found to constantly escape the ravages of the fungus to a considerable extent. Of these, several varieties have been found possessing a thick or tough skin, so tough that, although the mycelium of the fungus may enter by means of the open stomata of the plant, yet it cannot break through the skin in order to mature and shed its spores. These varieties have besides a waxy exudation on the surface of the plant similar to the bloom of fruit, which when present round the stomata, prevents the mycelium from entering.

No less than five hundred varieties of wheat had been under examination by the different members of the Conference, and in all the five Colonies represented at the Conference the following varieties have been found to enjoy more or less immunity from rust attacks:—Imperial Fife, Blunt's Fife, White Fife, Blount's Lambrigg, Marshall's No. 3, Tourmaline, Pringle's Defiance, Fluorspar, Allora Spring, Horneblende, Sicilian Baart, and the various Durums.

In the words of the report:—"One of the noticeable results of the labours of the Conference is seen in the present hopeful view of the situation—as to rust contagion—now taken by practical men. The number of persons who believe that complete immunity from rust in the wheat crop will be secured are perhaps as few as ever, but the existence of the feeling that the disease may be minimized, or so completely held in check that the loss from it will be small, is now all but universal."

It was, however, brought to the attention of the Conference that the hardy, high-quality red and amber wheats, which in Australia have shown themselves to possess great rust-resisting power, are not appreciated by Colonial millers, who will not buy them save at reduced rates, as they say they are hard, dark in colour, and cannot be manipulated by their machinery. The varieties, on the other hand, which are not rust resistant, and among which disease is most easily communicable, are the white, highly starchy, and often prolific sorts which the Colonial millers particularly affect.

The Conference, in view of this difficulty, resolved "that it is desirable in the interests of wheat-growing in Australia that another intercolonial Conference on the subject of rust-resistant

wheats and their milling qualities be held two years hence at Melbourne, and that such Conference be composed of wheat growers, millers, and scientific men having a knowledge of wheat and its diseases."

The Conference further affirmed the desirability of experiments of many kinds in the next two years, and as there are several experts engaged in, and devoted to, this work, including Dr. Cobb and Mr. Farrer, of New South Wales, and Mr. McAlpine, of Victoria, it is hoped that important results may be obtained.

It is no small matter to have established the fact enunciated at the last Conference, that there are several varieties of wheat proved capable of resisting rust to an eminent degree. There can be little doubt that other varieties will be found resistant or made resistant by careful selection as advised by Dr. Cobb.

BOUILLIE BORDELAISE AND POTATO DISEASE.

In the *Zeitschrift für Pflanzenkrankheiten*, Dr. Paul Sorauer reports the results of an interesting experiment with bouillie bordelaise as a remedy for potato disease, which was carried out in the dry season of 1893.

The experiment was made in a season in which the disease failed to make an appearance, and there was scarcely any prolongation of the period of vegetation of the haulms dressed with sulphate of copper. In the late varieties the foliage of the dressed plants remained green only a day longer than that of the untreated plants, and in the case of an early variety (Early Rose), the cessation of vegetation in the treated plot was simultaneous with that on the undressed plot. There was also very little difference in the yields. On a plot of Daberschen potatoes the yield of the undressed section was equal to that of the treated section, and on another plot sown with a variety known as Euphyllus, the undressed plants furnished a larger yield than the dressed. But, on the whole, the average yield from the plants which had been treated with the bouillie was 2 per cent. in excess of the produce of the undressed plots, and even this small increase sufficed to cover the cost of the treatment. Dr. Sorauer remarks that, in other experiments, it has also been found that the copper treatment somewhat retards the development of the potato plants, and this result corresponds with the results recorded above, and with those of most other similar experiments. This retarding influence, however, is only observed in the period before the outbreak of the disease in early varieties, the haulms of which had not fully developed their foliage. The yields obtained before the appearance of the disease were larger on the undressed plots; but this result was changed in favour of the treatment as soon as the disease had made its appearance.

MANGEL AND BEET RUST. *Uromyces betæ*, Persoon.

FIG. 1.



Rusted Leaf, natural size.

Rusted Leaf, magnified ($\times 10$).

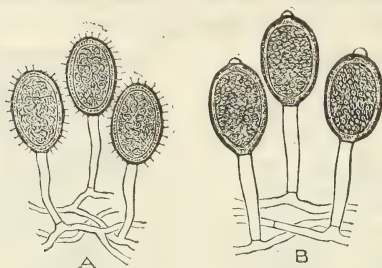
This is not an uncommon rust on mangel wurzels and beets in this country. It is also common in France, Germany, and other European countries, and in America and Canada. It is not generally noticed by farmers here, nor considered to be of much harm to the mangel crop; probably because its nature and its action upon the plants are not realised. Yet if it is thick upon the leaves, as it has been in some seasons, and especially in the last, it must cause serious injury. The fungus lives upon its host—the mangel wurzel, sugar beet, and garden beet—just as the wheat rust, *Puccinia graminis*, lives upon and injures the wheat plant, and must consequently hinder the full growth and ultimate development of the crop.

In the last season there was a great deal of rust upon mangel plants in many parts of the country. It was especially rife in the South Eastern counties, and in some fields reduced the yield considerably. In one instance in East Kent, it was estimated that a crop upon a considerable acreage was decreased by 11 tons per acre, according to the estimate of the grower, who stated that up to a certain time this was the finest field of mangels in the district; but it fell off rapidly when the rust spread over the leaves of the plants. Fields of mangels were noticed in which the rust was worse upon poor spots, as well as in wet, weedy corners and outsides. Now and then a field was seen in which almost every leaf was spotted with rust which extended even to the stems. The mangel crop has disappointed a good many persons this year, and this was due no doubt in a considerable degree to the wet weather; but rust also tended to hinder the bulbs from attaining full size, in many cases.

The *Uromyces betæ* attacks mangels on the Continent and in America and Canada. It is also very injurious to sugar beets in France, Germany, and the United States, by affecting the foliage and decreasing the amount of sugar in the bulbs.

This fungus is also frequently found upon garden beet, whose bulbs it causes to be small, malformed, and fibrous. It has been very plentiful upon these plants during the last summer and autumn, and in many market gardens, and gardens, materially injured the crop.

FIG. 2.



X·400

A. Uredospores. B. Teleutospores (×400).

The fungus *Uromyces betæ*, Link., belongs to the large group of fungi known as *Uredineæ*, and to the division *Auteuromyces*, or having all the spore-forms on the same host plant. The dangerous *Puccinia graminis*, causing wheat rust, belongs to this group also, but there are important distinctions in the life history of these two fungi. In the case of *Puccinia graminis* the *œcidium* stage, and the subsequent stages of uredospore and teleutospore, are passed upon different hosts; the *œcidium* stage upon the barberry, and the two latter stages upon corn plants.

The three stages of *Uromyces betæ* are passed upon varieties of the genus *Beta*, plants of varieties of *Beta vulgaris* and *Beta maritima* (sea beet), as the garden beet, sugar beet, and mangel wurzel. The *œcidium* or "cluster-cup," stage is to be found in the spring upon the leaves and stalks (petioles), of seed-beet and seed-mangel plants; that is plants which have been put out in the autumn to stand during the winter for seed. Mr. Plowright states that he found the *œcidium* of *Uromyces betæ* upon the sea beet, *Beta maritima*, in April.

The *œcidiospores* are orange-yellow, smaller than the uredospores and teleutospores, and are arranged in chains. They germinate and form mycelia in the leaf tissues, under the epidermis. From the mycelia suckers (haustoria) are formed, which exhaust the juices of the leaves for their own food supply. After a while hyphæ, or branching filaments, are sent forth from the mycelial centre; upon the end of each of the hyphæ a spore is formed. The spores by their pressure rupture the epidermis, or skin, of the leaf, as shown in Figure 1, and fall to the ground after a time, or on other parts of the plant, or are carried by the wind to infect other plants. These spores are larger than the *œcidiospores*; they are ovate, unicellular, pale brown, or light sherry-coloured, and echinulate, or having points or prickles, as shown in Fig. 2A. In suitable conditions there may be several generations of uredospores, but as the autumn approaches another kind of spore makes its appearance, as in the case of *Puccinia graminis*. This is the teleutospore (Fig. 2B.) which is more elliptical in shape than the uredospore, and is unicellular and slightly

larger, and darker in colour. These teleutospores are found in the same pustules, or sori, with the uredospores, or occasionally alone, and in this case, Sorauer says, they are always upon the stalks. The teleutospores are practically "resting spores," and pass the winter in this condition upon the dead leaves of beet and mangels, and probably upon the ground. From the teleutospores, sporidia are formed, which in suitable circumstances germinate and produce the oecidium stage upon seed-beet and seed-mangel plants.

Seeing that the fungus passes its series of stages upon plants of the beet family, the prevention and cure of its attack are rendered comparatively simple. The main object is to prevent the teleutospores from infecting in the spring the plants of mangel and beet set out for seed. To effect this every particle of leafage and stalks should be removed or deeply buried with the plough. None should be allowed to remain on the outsides of fields. If there is fear of infection, or the oecidiospores are noticed, the seed plants should be sprayed with a weak solution of sulphate of copper, of from 10 to 12 lbs. to 100 gallons of water and 6 lbs of lime. Some seed growers plant bulbs of mangel in the early spring for seed. These might be dangerous sources of infection. *Beta maritima* may be a fertile source of infection: as it is a perennial plant the teleutospores of *Uromyces betæ* would remain on it during the winter, and be distributed far and wide by the wind. Mr. Plowright produced the "oecidia of the fungus on two plants of mangel from the teleutospores from wild plants of *Beta maritima* grown on the banks of the River Ouse at West Lynn." It would be desirable to eradicate *Beta maritima* as far as possible from the neighbourhood of mangel and beet land. It grows by the side of neglected wet ditches, river sides, creeks of salt or fresh water. But it should be added that, this season, in the case of a field of mangels badly infected, which was situated near a creek, the plants of *Beta maritima* growing there were quite free from appearance of infection.

When mangel and beet seed-plants have upon their leaves the pustules shown in Fig. 1, they should be sprayed for the sake of their own crop of seed, and to prevent dissemination of the uredospores to neighbouring mangel and beet-root crops.

If mangel and beet-root crops exhibit signs of infection it would be desirable to spray them with sulphate of copper and lime solution—15 lbs. of sulphate of copper and 7 lbs. of lime to 100 gallons of water—before the fungus has been well established, to prevent its spread in the particular field and to other fields. Spraying was tried this season for this disorder, but not until the end of September, or too late to be of much service.

Sorauer says, in his *Pflanzenkrankheiten*, that leaves of mangel and beet infected with this fungus should not be given to farm animals.

ANOTHER POTATO FUNGUS (*Macrosporium solani*).

FIG. 1.

Potato Leaf, under surface, attacked by *Macrosporium solani*, natural size.

This fungus is not distinguished by casual observers from the ordinary potato fungus known as *Phytophthora infestans*, although, even to the naked eye, it is quite different in appearance. With a microscope it is readily seen that the two fungi are entirely distinct, and their action upon the potato plant differs also in many important respects.

The *Phytophthora* ravages the leaves and the stems, causing them to rot and decay, and finally descends to the tubers. The *Macrosporium* attacks the leaves and the stems extensively, but there is an absence of the rapid decay and stench which are so noticeable in the case of potato plants virulently attacked by the *Phytophthora*.

The *Macrosporium* spreads over the surfaces of the leaves and ultimately destroys them, making them shrivel up and thereby depriving the stems of the power to obtain supplies of food, so that the crop of tubers is small and of poor quality. This fungus does not descend to the tubers, in which no traces of the disease are to be found.

Potato plants were noticed early in August last to be attacked, as it was supposed, by *Phytophthora infestans*, but, as the symptoms were peculiar, they were closely watched. In time, the leaves dried up completely and fell from the stems, which remained standing upright for some time, though they collapsed when they lost their greenness, which happened in a few days and some weeks before the proper time. There were patches of the fungus upon the stems, but it is believed that their premature decay was due as much to the loss of their leaves as to direct

action of the fungus. Upon examining the potatoes when they were dug up they were found to be perfectly free from disease, but very small, and when cooked they were waxy and flavourless. Later on, the tubers were examined in the clamp, and there were then no traces of disease in them.

This disease was also noticed by several observers in allotment grounds, and small gardens, where potatoes are often grown repeatedly on the same plot.

In most of the previous descriptions of this fungus, notably in those of Ellis, Martin, and Saccardo, it is stated that it is found on the under surface of eroded spots and faded portions of the dying leaves of potato plants. It was, however, plainly seen in the past season growing and active upon living potato plants and most evidently deriving sustenance from them. In his annual report for 1892 to the United States Department of Agriculture, Mr. Galloway writes:—"Early in the season it was noticed that potatoes in Maryland and elsewhere were being seriously injured by a fungus attacking their leaves and causing them to turn brown and dry up. The tops of nearly all the early potatoes were destroyed in this way before the tubers were half grown, so that the crop was much shortened. The fungus causing this injury was, upon examination, found to be *Macrosporium solani*, a form widely distributed in this country upon the potato, tomato, and other plants of this family." In a recent Bulletin, No. 15, of the "Farmers'" series, the chief of the Division of Vegetable Pathology of the United States Department of Agriculture states that *Macrosporium solani* attacks, and destroys, the living leaves of potato plants, and that there is reason to believe that "this disease is often more widespread and destructive than the true blight, *Phytophthora infestans*."

In a report in 1892, Mr. Fletcher, the botanist to the Dominion Experimental Farms at Ottawa, writes of the defoliation of potato plants being due more to *Macrosporium solani* than to *Phytophthora infestans*. Mr. Weed, of the New Hampshire College of Agriculture, in his work on Fungi and Fungicides, shows clearly that *Macrosporium solani* is not saprophytic. He remarks that this disease appears early in summer in the shape of small brown, brittle spots scattered over the leaf; the spots gradually enlarge, and finally run together to form brown patches. The entire plant finally withers and dies long before the proper period, the tubers being small—generally less than half full size.

Figure 1 shows the under side of a potato leaf with the fungus upon it. At first, a small greyish-brown spot is visible. This extends gradually in concentric rings after the manner of *Macrosporia*, and pieces of the leaf eventually fall out leaving holes with ragged margins.

The appearance of this fungus is quite different from that of *Phytophthora infestans*. The hyphæ, threadlike branches of the mycelium, are brown, somewhat curved and septate, whereas those of the *Phytophthora* are colourless and not septate. The conidia, or spores, of *Macrosporium solani* are oblong, pointed,

FIG. 2.

*Hyphæ and Conidia of Macrosporium solani.*

and divided by transverse and longitudinal septa, while in the *Phytophthora infestans* the conidia are colourless and egg-shaped.

The hyphæ and the conidia (spores) of *Macrosporium solani* are illustrated in Figure 2. From the mycelial hyphæ at the base of the figure the conidiophores are put forth bearing the conidia, which fall out when ripe and may be distributed widely.

The fungus *Macrosporium solani* belongs to the family *Sphaeriaceæ* of the *Ascomycetes*. Its perfect life history is not known. It is probably, like many species of *Macrosporium*, an early or conidiophorous form of some known or unknown species of *Sphaeria*. The conidia from this form may rest for the winter on the decaying leaves and stems of potato plants or on the ground. Mr. Weed states positively that it winters over in the dead leaves and stems of the potato plants.

In the reports before alluded to, Mr. Galloway gives the results of spraying with Bordeaux mixture potato plants infected with this parasite. He says:—"For blight and the *Macrosporium* disease nothing so effective as the Bordeaux mixture has been found." These experiments were made in two separate fields with exceedingly gratifying results.

The Bordeaux mixture used was composed of about 14 lbs. of sulphate of copper and 8 lbs. of lime to 100 gallons of water.

Mr. Fletcher, in describing experiments with Bordeaux mixture in Canada for the *Macrosporium* disease, also testifies to its efficacy.

In potato fields in Kent, where large experiments were made with the Bordeaux mixture for the ordinary potato disease, it was noticed that there was but little injury from the *Macrosporium* and the *Phytophthora* upon the sprayed rows, but upon the

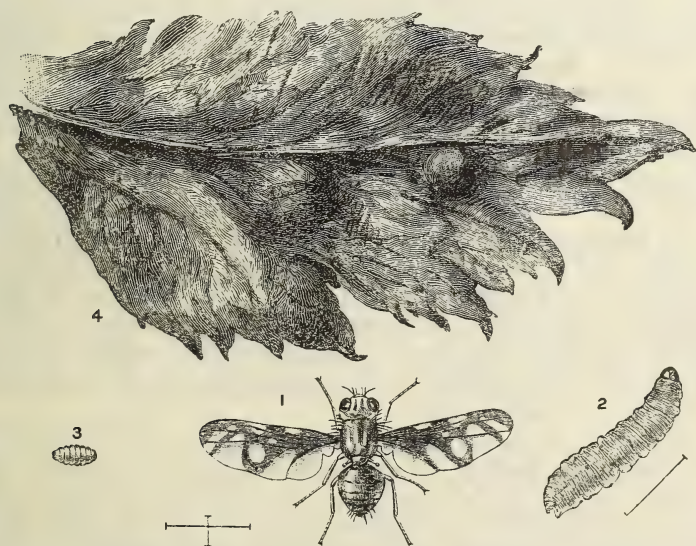
unsprayed test rows considerable harm was caused by both of these fungi.

In the experiments in the United States, the Bordeaux mixture was applied when the plants were about 6 inches high, and at intervals of about 14 days. In Kent, spraying was commenced late when the plants were high, and repeated twice in some cases.

It would be most desirable to spray potato plants for this affection just as for that of the *Phytophthora*, both as a preventive and as a curative measure. The results of experiments in the last season have proved that spraying with Bordeaux mixture is of the greatest value in preventing and checking the attacks of the old enemy *Phytophthora*, and according to the records of foreign and home experiments it appears to be equally effectual in the case of the new enemy, or newly discovered enemy, *Macrosporium solani*.

Though it is not yet quite clear where the resting spores of this fungus pass the winter, it would be wise to destroy every particle of decaying leaves and stems in infected fields.

THE CELERY FLY (*Tephritis onopordinis*, Fabr.).



1. Fly magnified. 2. Larva magnified. 3. Pupa, natural size. 4. Leaf mined by larvæ. Lines show length of fly and larva.

Much harm has been caused to celery and parsnips this autumn by the maggots of this celery fly. Though this attack came comparatively late, it was very severe, and maggots were found in the leaves up to the end of November. In mild seasons, it is said, they are found as long as the leaves remain on the plants. Parsnips were similarly attacked in many places.

The maggots make mines or passages in the parenchyma of the leaf, and feed upon its soft juicy substance. The leaf soon contracts and becomes bronzed in colour. After a time it shrivels up and is utterly useless to the plant as a means of respiration and of taking in food from the air. In the case of a celery plant thus infested, the stalks or stems that have been earthed-up, in order to blanch them, cannot properly grow and fill out. Sometimes the plant is killed, or the celery is green and small. As the cultivation of celery is very extensive, some growers planting as much as from 50 to 100 acres, the losses are often most serious.

With respect to parsnips, the injury to the leaves is the same as in the case of celery, and the roots are small, much forked or badly shaped.

The fly (No. 1) is very small, only about eight lines—the eighth of an inch—in length, and has a wing expanse of not quite half-an-inch. It is of a tawny brown colour or honey yellow, as Meigen terms it, with the under part of the body light coloured. The wings have oblique lines of rusty or brownish spots running through their upper parts, while the lower parts are hyaline. It has six legs, of a dark yellow hue. When it is at rest upon the plants its wings are upright. The female fly has a long ovipositor with which it places its eggs, singly, upon the cuticle of the upper sides of celery and parsnip leaves. Many eggs are laid by one insect. They are hatched in about six days, and the larvæ (No. 2) from them are pale green, without legs, thick in body, somewhat pointed at the head, and square at the tail extremity. When full grown they are close upon a quarter of an inch long.

In about 14 days, the larva changes into a pupa and either remains in the leaf or falls to the ground. From the pupa (No. 3), which is of a yellowish colour, oval, and much wrinkled, becoming darker later on, the fly emerges in a few days and commences a new series of existence. There are two or more generations in a season. The pupæ of the last generation, which is determined by conditions of weather and food supply, pass the winter in their pupal form in the ground, and in the remains of the leaves or in rubbish near.

It is worthy of record that larvæ of this fly were found late in November in the folds of celery stems, close to the bulb-like end, they were in the folds nearest to this, and as the folds were tightly packed round the bulbous end, the larvæ must have mined their way through and down parts of the stems, as it was impossible that they could have merely fallen down from the leaves. Mr. Theobald, of the Wye Agricultural College, also has recently found the larvæ of this fly in this position. This discovery was made while closely examining celery plants for the larvæ of the Celery Stem Fly, *Piophila apii*, another troublesome pest of celery, and it appeared from the position of the *Tephritis* larvæ that they were feeding upon the sweet and softer parts of the blanched stems.

Modes of Prevention and Remedies.

As many of the pupæ are in the earth, it is most essential, when the celery crop has been taken from the trenches, that the earth should be levelled carefully and dug deeply, and the upper surface put well underneath to prevent the flies from coming up. This should be done in the same way with infested parsnips. A good dressing of lime, or of lime ashes, or of gas lime, might be applied with advantage. Every particle of foliage and stem must be deeply buried, or it is better that these should be collected and burnt directly the celery or parsnips have been dug. If the leaves are merely placed in lumps, or upon composts, or mixens, not in active fermentation, it is very probable that pupæ may be carried out with manure for celery or parsnips. This pest will not be stamped out unless celery and parsnip growers are most particular in destroying the leaves of infested plants. Thistles should be eradicated. Meigen says it is occasionally found on thistles, and Macquart states that it infests them in France and Germany.

In gardens, or where only a few rows of celery or parsnips are grown, it is possible to check the attack, at all events to some extent, by pinching the infested leaves to kill the larvæ in them. But where celery and parsnips are largely cultivated this remedy would be out of the question.

It is desirable to force rapid leaf growth where there is a bad attack. Nitrate of soda mixed with a little agricultural salt will effect this.

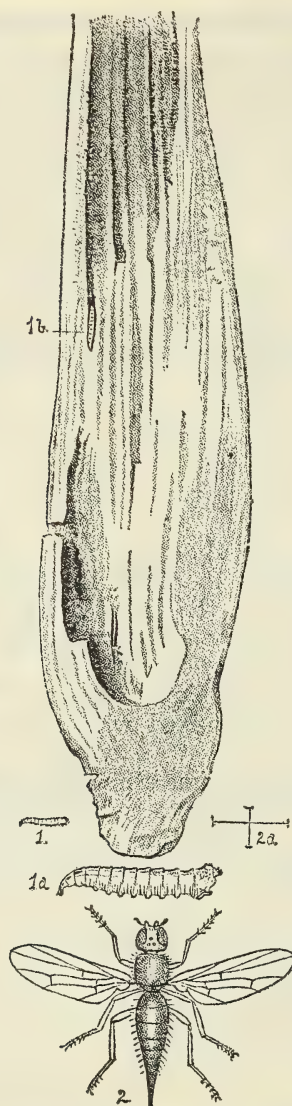
Soot or finely powdered lime scattered over the plants when the dew is on them is likely to prevent the flies from laying eggs upon the leaves. A mixture of one bushel of lime to three bushels of soot has been found very useful, put on when rain or dew is upon the leaves.

Spraying with various substances has been found most beneficial. A mixture of paraffin and soft soap and water at the rate of a pint of paraffin and 8 oz. of soft soap to 10 gallons of water has been found effectual, put on with a knapsack machine. The extract of 12 ozs. of quassia chips and 8 ozs. of soft soap to 10 gallons of water proved serviceable. The spraying was done twice.

*CELERY STEM FLY (*Piophilila apiæ*, Westwood).*

This fly, though not so well known as the other celery fly, *Tephritis onopordinis*, sometimes does even more harm to the celery crop. In the present season, 1894, it has seriously injured the celery in many localities.

The larva (Fig. 1) of this fly bores into the stems, or petioles, of the celery from the point where the earth is backed-up to bleach them, down to the bulbous end. In stems, or petioles, examined, the passage of the larva was traced sometimes in the tissues to the middle of the stems, then turning to the outside, and again towards the middle to the extreme lower part. Here and there, large holes were seen caused by



Celery Stem Fly.—1, 1a. Larva, natural size and magnified. 1b. Larva in celery stem. 2. Fly magnified (after Westwood). 2a. Lines showing natural size of fly.

the tissues rotting away, and the little red line showing the progress of the maggot appeared below the decay. The outer green, or partially-bleached, stems were attacked evidently first, then the inner perfectly-bleached short innermost stems were entered just below the little yellow leaves, and tunnelled in the same way. The crown of the root also showed marks of occupancy, and below this there was also in some cases decay of the tissue. A larva was found in many of these passages at various distances from the top of the stem. Usually, only one larva was found in a passage; now and then there were two or more in a stem, but in different parts of it. Much of the celery thus

infested was unfit for table. Some of the stems were quite rotten, only just the inner or "heart" part being sound and white. In some instances, the leaves of the celery plants infested with the larvæ of *Piophilæ apii* were mined by the *Tephritis onopordinis*, and it appeared as if they were also feeding on their sweet juices, for some of the *Tephritis* larvæ were found within the closely-packed folds of the stems.

The fly (Figs. 2, 2a), which belongs to the genus *Piophilæ* of the order *Muscidæ*, is two lines, or the sixth of an inch, long, and has a wing expanse of four lines, as described by Professor Westwood. Its body is dark with a light brown-coloured head. The wings are white with light brown veins, and the legs are light yellow. Eggs are laid by the females upon the celery stems just below the leaves, which is the point from which the larvæ commence their mining operations. The larva is about $3\frac{1}{4}$ lines, or slightly more than the fourth of an inch in length, yellowish-white in colour, very shiny, with two dark spiracles at the tail end, and from these the two delicate air vessels, noticed by Professor Westwood, like silken threads, run along the whole length of the body, just under the skin, to the segment "just behind the head, where they are connected with two exserted appendages," which are well developed and stand out clearly. The anterior end is sharply pointed, and the black mouth and head are "capable of being withdrawn into the subsequent segment," and this is constantly done with every movement of the larva. Under the skin, on the second and third segments from the tail end, there are reddish patches, at least these were seen in all of the many larvæ examined.

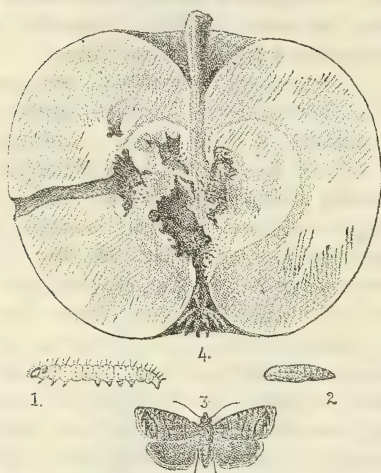
The pupal state is assumed quickly in the celery stems, at least in the first generations. In the last generation, the larval life seems to be protracted, as larvæ, together with pupæ, are found in very late dug celery. Some of the larvæ go into the earth to pupate, as may be seen from their exit holes at the base of the crown of the root.

Methods of Prevention and Remedies.

Unfortunately, though obviously, these are but few. Spraying the stems with paraffin and soft soap at the rate of one pint of paraffin, and 8 ozs. of soft soap, to 10 gallons of water, or with carbolic acid and soft soap, put on with a knapsack machine, would certainly prevent the later generations from laying eggs upon the stems, and the larvæ from boring into the stems. In places liable to be infested it would be well to spray as a matter of precaution.

Every particle of infested celery plants should be picked up and burnt, and the trenches levelled down and the ground deeply dug, so that all pieces of celery and pupæ that have been missed may be deeply covered. Lime, lime ashes, or gas lime might be advantageously dug in.

THE CODLIN MOTH
(*Carpocapsa pomonella*).



1. Larva ; 2. Pupa ; 3. Moth ; all natural size. 4. Infested apple.

In some seasons almost incalculable harm is caused to the apple crop by the larva of the Codlin Moth. Early and late apples appear to suffer equally, and no variety escapes this attack. The moth is indigenous to Europe, but it has been gradually introduced, no doubt in infested fruit, into all apple-growing countries. It has been known in the United States and Canada since the beginning of the present century, according to Professor Riley, and does infinite mischief in some seasons. It has only been noticed in Australia in comparatively recent years.

Mr. Frazer Crawford says it was not known in South Australia before 1885, but it had ravaged many orchards in Victoria for some years previously. In New Zealand it was first noticed in 1874, and the Tasmanian apple-growers were visited by it first about 33 years ago, and it is now found by them to be such an unmitigated pest, and so damaging to their beautiful fruit, that the Legislature has passed an "Act to make better provision for the destruction of the Codlin Moth."

This very pretty moth is small, only measuring about three-fourths of an inch across the upper wings, which are of a brown colour slightly streaked with grey, and becoming darker brown near the hinder corner, upon which there are streaks of deep gold colour, extremely brilliant in sunshine. The hinder wings and abdomen are brown and lustrous.

The moth appears in the spring at the time that the apples are setting, and, when they have set, it places a yellowish egg in the calyx end of the fruit, fastening it there with a glutinous

substance. Only one egg is laid upon an apple, either in the dusk of the evening, or in the early morning.

A female lays a large number of eggs, variously computed at from 50 to 200. In about eight days the larva comes from the egg, and at once bores into the fruit in the direction of the core. At first it is white with a black head, and can hardly be seen without a glass. In about a week it is not quite the fourth of an inch long, and in three weeks it is full grown, or nearly three-fourths of an inch in length, and then it is of a flesh colour with a brown head (Fig. 1). It has three pairs of feet, and five pairs of sucker feet, and its body is covered with hairs. The larva works its way down to the carpel in the centre of the fruit to its ultimate goal—the ovules, or pips (Fig. 4). When it has consumed these, or when its term has come to an end, it makes its way out of the apple by a tunnel bored through the fruit and descends to the ground by the help of silken threads from its body. Sometimes the action of the larva upon the apple causes it to fall before the larva is full grown, which quietly escapes from it in due time. The larva then crawls up the nearest apple tree, and scoops out a little hole under the bark and spins an oval nest, or cocoon, in which it remains through the winter, and assumes the chrysalis form towards the approach of the spring (Fig. 2). Probably some of the larvæ fall from the apples on to branches below and make their cocoons at once under the bark.

In some countries there are two and even more broods, and the pupal form, at least in the first broods, is assumed at once in the cocoon, and the moth comes forth in about 10 days. It is not known positively whether there are two broods in this country. It is, however, most probable that there are, as it has been noticed that apples are often attacked when they are quite large, and that in these circumstances the egg is often laid upon any part of the apple. There are either two broods, or there is a singular retardation in the development of the moths caused by weather influences.

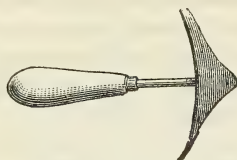
The larva on leaving the fruit, as a rule, goes to a fruit tree, but it sometimes makes a cocoon in rubbish, weeds, or grass near. In orchards, its winter retreat is generally a fruit tree.

But in plantations where fruit bushes and raspberry canes are planted with apple and pear trees, the cocoons have been occasionally found under the rind of gooseberry and currant bushes and raspberry canes, as well as under the bark of apple and pear trees overshadowing them.

Modes of Prevention and Remedies.

In orchards where the fruit has been infested, the grass should be brushed or fed down close, and rubbish collected and burnt. The loose bark of the trees should be scraped off as far as possible, and if many cocoons are seen a mixture of soft soap and paraffin oil should be worked in with stiff brushes. Hot

lime-wash would be efficacious if it were well worked in after the trees had been scraped. A useful tool for scraping the bark is shown below :—



A bark-scaper.

Pieces of old sackcloth should be spread beneath the trees during the scraping process to catch the bark and cocoons, which should be burnt at once.

The most important mode of prevention is to entrap the larvæ as they ascend the trees to make their cocoons. This is done effectively in America, Australia, and Tasmania by fastening bands of old cloth, rags, brown paper, hay, cake and manure bags, and other suitable materials, round the trees not far from the ground to stop the larvæ and collect them, so that they may be taken from the bands and destroyed. The bands should be tied tightly round the stems, so that the larvæ cannot crawl under them, and examined frequently, and the larvæ removed. In Tasmania, by the Act of Parliament alluded to above, regulations prescribe the time and manner in which apple trees shall be banded for the Codlin Moth.

Pieces of rags, and old sacking or bagging, are also laid in the forks of apple trees and their branches by American fruit growers to catch the larvæ, and are examined from time to time.

The apples from infested trees should be picked up at once and given to pigs. Sheep should be pastured in orchards, in which they are always of the greatest service, as they would eat the dropped infested fruit. Pigs, if it is possible to let them run in the orchards, would be even better than sheep for this purpose. In plantations, all windfalls from infested trees should be picked up at once. If these apples are small and immature, and not fit for "smashing," they should be given to pigs. In cider-making districts, the places where apples have been laid in heaps should be treated with hot lime dug into the ground some distance round them, or the ground should be well watered with strong soapsuds, or ammoniacal liquor, or liquid manure.

Spraying apple trees for the Codlin Moth is extensively practised in Australia, Canada, and the United States, from all of which countries the testimony in its favour is very strong, and its use increases yearly. Various mixtures are adopted, but the best and most general is Paris green put on in a liquid form. The strength of the mixture recommended is 1 lb. of Paris green to from 250 to 300 gallons of water, according to the state of the foliage. Spraying should take place directly the young apples are set, and repeated at the end of a fortnight, especially

if heavy rain falls. On no account must the spraying be done when the fruit stalk end of the fruit is uppermost.

When the apples from infested trees are stored, those with holes should be rejected, as far as possible, as there may be belated larvæ in them. Store-rooms, in which infested fruit has been stored, should be treated with hot lime-wash, with a little sulphur in it, well brushed into the chinks and cracks in the boarding or plaster.

Legislation against the Codlin Moth.

Owing to the prevalence of the Codlin Moth in Tasmania, and the serious injury it causes by spoiling and disfiguring the apples which grow so well in the Colony, the Legislature of Tasmania in 1888 passed an "Act to make better provision for the destruction of the insect known as *Carpocapsa pomonella* or the 'Codlin Moth.'"

The Act provides that Boards shall be elected by fruit growers in every district, to carry out the provisions of the Act. Inspectors are appointed by the Boards to see that the Regulations made by the Governor in Council are carried out. These Regulations prescribe the manner in which, and the times at which, the occupier of every orchard shall—(a.) Give notice of his orchard being infested; (b.) bandage, dress, or otherwise treat infested trees in his orchard; and (c.) furnish any return requested by the Act.

They also prescribe the manner in which, and the time at which, infested fruit shall be destroyed, or rendered fit for the food of any animal; the manner in which, and the time or times when any box, barrel, bag, or other receptacle that has contained the moth or any infested fruit shall be cleansed and rendered fit for further use; and the manner in which, and the time or times when bandages used upon infested trees shall be destroyed, or cleansed, or otherwise rendered fit to be again used for such purpose.

Power is given to the Governor in Council to impose by regulations a penalty not exceeding 5*l.* for a breach of or non-compliance with any such regulations.

By the Act, no person is allowed to bring into Tasmania any fruit infested with this moth, or any receptacle containing it, or which has at any time contained infested fruit, unless it has been previously cleaned to the satisfaction of an inspector; and every person who sells, or exposes for sale, any fruit infested with this moth is liable to be fined 5*l.*

The Boards are empowered to order occupiers of orchards within a month after notice to cut down any decayed or diseased trees growing in such orchards, under a penalty of not exceeding 5*l.* for failing to carry out such order.

XIV.—GENERAL AGRICULTURAL NOTES.

LIVE STOCK.—QUEENSLAND.

In the Report of the Registrar-General of Queensland on the returns of agriculture and live stock in that Colony for the year 1893, it is stated that the numbers of the various kinds of live stock in the Colony at the end of 1893 were :—Horses, 429,734 ; horned cattle, 6,693,200 ; sheep, 18,697,015 ; and pigs, 68,086. These figures as compared with those of 1892, indicate an increase in horses and cattle of 7,000 and 100,000 respectively, and a decrease of 3,000,000 in the number of sheep, and of 50,000 in the stock of swine.

In explanation of the fall in the numbers of sheep and swine, it is regarded as probable that the ownership of live stock, which involved increased taxation under "The Meat and Dairy Produce Encouragement Act of 1893," made proprietors more careful in compiling returns of stock than hitherto, which, no doubt, occasioned a shrinkage in the numbers given in the schedule, the figures for previous years having been, perhaps through carelessness or otherwise, rather over than under-stated.

As regards horses, the present supply is considered to be more than sufficient for the requirements of the Colony ; and unless a considerable market outside Queensland should be found, any extended increase in the number of this description of stock is neither to be looked for nor desired. A small outlet, however, has been lately opened up with India, and it is thought probable that this trade is capable of expansion.

From the small per-centage of increase in cattle, and the considerable per-centage of loss in sheep, it will be at once perceived that the returns for 1893 show most unsatisfactorily when compared with those of the previous year. Two causes, it is believed, have conjointly operated to bring this about—namely, first, the losses by drought ; and, secondly, a desire rather to under-state than to exaggerate the number owned by each proprietor.

In view of the low prices ruling for cattle, and the difficulties of finding a profitable market for the surplus, the falling-off in the increase is for the present not regarded as a matter of much moment ; but with respect to sheep it is different, and in consideration of the value of that animal for wool production, the loss in this kind of live stock, if the returns can be strictly relied upon, is felt to be one of grave import.

The increase in sheep for the previous two years is stated to have been at the rate of about 10 per cent. per annum, but in 1893 there was a decrease of 13 per cent., making an apparent deficit in the latter year, as compared with the progress of 1891

and 1892, of 23 per cent. Assuming the consumption of mutton in the Colony to have been relatively equal for each of the three years, the number of sheep otherwise disposed of differed materially last year. In 1891-2, the yearly average number of sheep preserved, frozen, boiled down, and disposed of by excess of export over import was estimated at 495,712, or just over two per cent. on the mean number of sheep in the Colony. In 1892-3 2,080,065 sheep, or rather more than 11 per cent., were, it appears, relegated to foreign markets by means of one or the other of the above-mentioned channels; no less than 793,290 having been exported over the border in excess of those imported in the same way. It is also pointed out that in years of drought, such as 1893, proprietors are forced to dispose in some manner of their sheep, the usual method being to boil down to prevent total loss from want of feed and water, and that, at such a time, lambs are destroyed wholesale to preserve the ewes.

As an example of the progress of the pastoral industry in the Colony, it may be observed that, in 1886, rather more than one million pounds weight of meat were preserved or frozen; whilst in 1892 and 1893, 28,273,600 lbs. and 40,466,328 lbs. respectively were thus dealt with; in the latter year also 11,183 tons of tallow were produced as compared with a production of only 97 tons in 1886.

The opportunities afforded for the disposal of the surplus stock of the Colony are said to have been greatly extended by the expansion of the meat trade with Europe; and the export of stock alive, and not in the carcase, is a matter of too great importance to be lightly overlooked. In respect of cattle, Queensland is the premier producer in point of numbers of all Australasia, and consequently has always exported a large number of beasts to supply beef for the southern markets. The fiscal policy of Victoria has, however, recently almost closed the markets of that Colony to Queensland stock, and in New South Wales a similar result has been in part brought about by the necessity forced upon that Colony of purchasing less fat cattle in order that she may consume her rapidly-increasing surplus of sheep. But, notwithstanding the circumstances above referred to, Queensland exported last year 176,660 cattle in excess of the number imported.

Sheep claim a primary value as wool producers, the number in Queensland being so much within the capabilities of the Colony. The Southern Colonies, moreover, are not often in need of this kind of stock. The imports of sheep into Queensland, therefore, usually exceed the exports, although in some years special circumstances cause a reversal of this rule. In 1893, for instance, the exports more than quadrupled the imports, amounting, as previously stated, to 793,290 in excess of the imports. It is probable that the drought on the south-western border may have had something to do with this, as it may have

induced some owners to part with sheep at a price that proved irresistible to southern graziers who were in a better position with respect to feed for their flocks.

The numbers of horned cattle imported in 1892 and 1893 were 6,923 and 7,003 respectively; while the exports for the same two years were 130,989 and 183,663 respectively; 463,323 sheep were imported in 1892 and 223,655 in 1893, whilst 421,318 sheep were exported in the former year, and 1,016,945 in the latter.

EXPORT OF TASMANIAN BUTTER.

The export of Tasmanian butter has recently occupied the attention of the Tasmanian Council of Agriculture. In a recent report of the proceedings of the Council, it is stated that up to February 1894, 80 tons of butter had been shipped from Tasmania to England. This should result in bringing into the Colony about 8,000*l.*, and as it represents an entirely new industry, so far as Tasmania is concerned, it is cause for congratulation. There have been some difficulties connected with the shipping of the product; but an effort has been made to minimise these difficulties for the future. It appears that an extra freightage, amounting to 5 per cent., is charged upon Tasmanian butter by the steamship companies. The charge though small makes the export of butter from Tasmania more difficult owing to the cost of transhipment. Moreover, the charge is considered unjust, because it is not made upon butter from New South Wales and South Australia, which Colonies have not, like Victoria, a contract with the companies. In view of the difficulties attending transhipment, some correspondence has taken place between the Tasmanian Committee of Advice and a firm in Melbourne. It has been suggested that the Tasmanian Government should accept the guarantee of the firm and appoint them to act as agents in Melbourne. This course was approved at a meeting of the Dairy Factories' Association of Tasmania, at which a resolution was carried requesting the Tasmanian Council of Agriculture to take steps to secure cold storage space for the export of butter to England in 1894-5 on vessels regularly carrying Australian butter, an agreement being offered by the above-mentioned Melbourne firm to fill up any portion of the space applied for and not utilised by factories shipping produce through their agency. Subsequently the whole subject was exhaustively reviewed by the Council of Agriculture, with the result that a communication was forwarded to the Treasury recommending that the Melbourne firm should be appointed to act as brokers for the Tasmanian Government in this matter, that space should be secured for 100 tons in November 1894, 120 tons in December 1894, and 90 tons in January 1895, at the same rate as that which the Victorian Department of Agriculture agrees to pay, and that the butter should be shipped in the same boats as the Victorian butter. Failing this arrangement, the Treasury

was requested to communicate directly with the steamship companies, demanding that, in consideration of the subsidy paid by Tasmania for mails, space should be reserved at the same rate of freight as that paid by Victoria. To this the Treasury replied stating that space for 310 tons had been secured by two of the principal steamship lines during the years referred to. Further negotiations have taken place with a view to a final settlement of terms. It appears that both of the steamship companies are willing to give the Tasmanian Government the same terms from Melbourne as those given to the Victorian Government.

DAIRYING AND POULTRY-KEEPING IN RUSSIA.

The *Moscow Gazette* has recently published information relating to the measures which the Russian Ministry of Agriculture proposes to take to counteract the effect of the depreciation of cereals in that country.

It is contended that the most effective remedy is to stimulate the different branches of agriculture—dairying and poultry-keeping in particular—in such a manner as to convert grain into more remunerative products. It has accordingly been decided to render assistance to the dairy industry by employing experts from abroad, and by publishing instructive information on dairy processes. It is also proposed to raise loans for the establishment of cheese and butter factories. Improvements are to be introduced in the system of conveying dairy products by rail, and the railway rates are to be reduced. Depôts are to be established for the storage of butter and cheese, and the market prices of these articles are to be regularly published. It is expected that the dairy industry in Russia will by this means rapidly develop.

A recent official publication, to which reference was made in the last number of this Journal, has shown how small is the poultry-keeping industry in Russia, although the conditions necessary for its extension are favourable. The *Moscow Gazette*, in advocating this extension, states that there is an increasing demand, especially from abroad, for Russian eggs and poultry. To show the extent of this demand, statistics are given from which it appears that the export of eggs from Russia was eleven times larger in 1893 than in 1882. Great as this increase has been, it is, however, stated to be small in proportion to the demand, the imports into England and Germany alone being five times as large as the Russian exports of eggs.

If poultry rearing has not developed to a large extent in Russia, it is probably due to the fact that, until comparatively recently, the cultivation of cereals was remunerative. In view of the increasing foreign demand for eggs and poultry, an effort is being made by the Government to foster the industry, and in official circles it is contended that the peasantry will be the class to gain most by this development.

AGRICULTURE IN URUGUAY.

A recent number of the *South American Journal* contains some information, extracted from the *Siglo* of Monte Video, respecting the production of cereals in Uruguay.

It is stated that recent statistics have fully proved that the productive movements of that country are much more active now than they were in 1893. In the first half of the present year, there were exported from Uruguay 1,591,000 cwts. of wheat, 412,500 cwts. of flour, and 157,000 cwts. of maize. Adding to these birdseed, barley, and bran, the exports of cereal products amounted to nearly 2,300,000 cwts., worth at the current market prices over \$2,000,000.

In 1890 the exportation of wheat amounted to 353,500 cwts. and of flour to 9,800 cwts.; while the quantity of maize exported in the same year was 78,571 cwts.

These quantities decreased in the intervening years until the commencement of the reaction in 1893, the figures for which were still below those of 1890. Summing up the commercial statistics, the exports of cereals from the Republic in the four years 1890 to 1893 inclusive comprised 484,000 cwts. of wheat, 250,000 cwts. of flour, and 141,000 cwts. of maize.

Thus in the first six months of the current year Uruguay has exported more than three times the wheat, nearly double the flour, and rather more maize than in the total exportation of the four preceding years. The great fall in prices is said to have prevented agriculturists from gaining the results they had hoped from so splendid a harvest.

CONSUMPTION OF MARGARINE IN DENMARK.

According to the *Ugeskrift for Landmænd* of the 19th October last, there were 16 margarine factories in operation in Denmark on the 31st March last as compared with 19 at the same date in 1893. The total production of margarine from Danish factories in the year ended 31st March 1894 was 17,800,000 lbs., and the import of this article during the same period amounted to about 2,487,000 lbs. The export of margarine is practically "nil," so that about 20,287,000 lbs. of margarine were consumed in Denmark in the 12 months ended March last, this being at the rate of about 10 lbs. per head of the population.

The production of margarine cheese is on the decline, the total output in the year 1893-94 is estimated to have been 33,000 lbs., as against 220,000 lbs. in the previous year. This decline is accounted for by the fact that the cheese has to be marked "margarine cheese," and this name is said to discourage customers from purchasing it.

THE CULTURE OF CRANBERRIES.

The culture of cranberries is an important industry in some of the American States. Massachusetts and New Jersey are its chief centres, though there are some cranberry "meadows" in Iowa, Minnesota, Michigan, and Wisconsin. In Massachusetts alone the crop of cranberries in 1891 amounted to 157,000 barrels, valued at 25,000*l*. Quantities of cranberries are imported into England from America, Russia, and Sweden, and are much esteemed, being utilised in the form of preserved and stewed fruit or in pastry. But the American cranberries are, it is said, better in flavour, size, and quantity than all others.

The cranberry, *Oxycoccus macrocarpon*, belongs to a group of the *Vaccinaceæ*. It is a small hardy evergreen shrub, bearing a sharp acid fruit whose colour varies from light dull pink to a dark purple. It is indigenous to America, being found in a wild state in boggy land throughout the northern portions of the United States, in parts of Canada adjacent, as well as in the marshes and glades of the Alleghanies as far south as Virginia and North Carolina. It is also found in South America and in some European countries.

According to several authorities, the species of cranberry in Britain is *Oxycoccus palustris*, slightly different in habit from the American species, and its berries are smaller and not of such a crimson hue.

The cranberry has not been systematically cultivated in Great Britain, but it formerly grew very extensively in marsh districts, notably in Lincolnshire and in Norfolk, also on the borders of Cumberland, and its sale proved profitable to the inhabitants. Cranberries have been cultivated in recent years in England, but only to a small extent. There is a bed at Petworth in Sussex, and some good beds at Ashburnham, which were established over 60 years ago. They were formerly fishponds, whose water was drained off and the bottoms covered with brickbats upon which rough peat was laid and fine peat and sand put on this. The beds are arranged so that they can be easily flooded, as it is necessary that the land should be irrigated up to the time of the plants flowering. It has been more than once suggested that as a large quantity of this fruit can be obtained per acre—from 80 to 100 bushels according to Downing in his *Fruits and Fruit Trees of America*—it would be desirable to cultivate the American cranberry in this country. Mr. Milne, Withering says in his *Botany*, reported favourably of experiments made in cranberry culture to the Horticultural Society, and that cranberries "might be made to grow with little trouble in places and on soils where few other useful plants yet known will grow to advantage."

The cranberry grows naturally in spots well supplied with moisture upon peaty or sandy soil. Any admixture of clay appears to be fatal to its progress, and no other than alluvial soil is suitable for it. On the question of soil for the cultivation of

the cranberry, Professor Agassiz says: "Never use the drift formation in preparing cranberry grounds; use silicious sand that has been entirely separated from loam by the action of water." Upon pure deep black peat, the cranberry grows faster and more vigorously than on any other soil; but after the first year, the crop is poor or fails, and it is essential to have a certain amount of sand or siliceous matter with the peat to ensure continuously good crops.

Silica hardens the wood, prevents the too vigorous growth of vines, and discourages the growth of weeds.

Cranberry plants or "vines," as they are termed in America, will not thrive on land with a wet sub-soil. Drainage is therefore essential. At the same time, it is requisite to irrigate or flood the land from the end of October to the first of May with from 18 to 24 inches of water. Flooding prevents the vines from the effects of winter frosts, and it must be carefully done and before frost comes. When the water is drained off in May the plants are soon covered with pink-white blossoms, and fruit quickly appears.

Sluices and flood-gates are requisite for flooding unless there are natural facilities. It is stated that the continued success of a cranberry plantation depends very greatly on the readiness with which water can be admitted upon the surface or withdrawn from it when spring-time arrives.

While the water covering the cranberry vines is frozen, some cultivators in America take the opportunity of carting sand and spreading it on the ice, so that when the ice melts the sand is distributed around the vines.

On soils properly prepared by spreading sand on the peat the ground is marked out in rows 14 inches apart. Two "vines" to form a stock are put 14 inches apart in each row and pressed into the ground. The smallest pieces from the "vines" will grow, and sometimes the vines are cut into pieces about an inch long and sown broadcast upon the prepared ground and harrowed in like corn.

Ordinary lengths of vine are spread evenly over the ground and covered with an inch of sand. "The young shoots come up through the sand as thick as wheat, making an excellent growth, and the whole surface is covered with them." The spring is the usual time for planting the vines in America.

There are many kinds of cranberry in America. The best is a standard early variety which ripens early in September, and a standard late variety which ripens about a month later.

Until the vines are well set it is necessary to keep the land well drained. Even if planted on ground well adapted to their growth, if the meadow is allowed to remain very wet the vines will make little or no growth.

In America the hoe is rarely needed to eradicate weeds and grass, and its use and that of a cultivator is injurious. Weeds are best eradicated by hand-pulling.

Manuring or excessive manuring produces rank, unfruitful vines. Guano is sometimes applied in America at the rate of from 50 to 250 lbs. per acre. Bone dust is also used.

In America the usual picking season is in October. The berries are sometimes gathered by means of a rake called the cranberry rake; but the finest and most valuable berries are those gathered by hand as strawberries are picked.

There must be many spots in England, which are practically useless for other crops, where cranberries might be successfully cultivated. The main requirements are a peaty soil with sand, and a good water supply for irrigating the land easily and economically at times during the summer, but it would not be necessary to flood the beds during the winter in this country.

INSURANCE OF CROPS IN RUSSIA.

The *Wiener Landwirthschaftliche Zeitung* states that the Russian Government has recently devoted some attention to the subject of harvest insurance owing to the terrible distress caused amongst the peasantry of a large part of Russia by the failure of the harvest in 1891 and 1892. A project was started in 1893 with the object of affording assistance in the future by means of some form of insurance. The scope of this scheme of harvest insurance was confined to the 50 European Governments of Russia. The project is based upon two forms of harvest or crop insurance, one of which, applying to all peasants' holdings, is compulsory, the other, applying to other kinds of holdings, voluntary. Fields which have been abandoned, or so poorly cultivated as to offer no prospects of a crop, are excluded from insurance; for these no payment is made. The premium charged is on an average about fivepence per acre. Naturally this amount varies according to the condition of soil and climate. Detailed provisions are made for the settlement of premiums, not only in the several Governments, but also in respect of the local condition. Payment of these premiums may be made either in cash or in corn. In the case of compulsory insurance the minimum yield per acre is taken as a normal basis.

It is proposed that as soon as the scheme has been sanctioned the compulsory insurance of peasants' holdings shall continue for life.

THE NATIONAL HIGH SCHOOL FOR AGRICULTURAL INDUSTRIES IN FRANCE.

The Government High School, which was opened at Douai last year, is the newest of the six *Écoles nationales d'Agriculture* which have been established in various parts of France. Two of these institutions—one at Grignon, near Paris, and another

at Grand Jouan, near Nantes—are intended to teach *grande culture* generally. The *École nationale* at Montpellier in the south is viticultural, rather than agricultural; and the National Horticultural School at Versailles, as well as the National Dairy School at Mamirolles, in the Jura, have each a special object as their titles imply.

The Douai school was established by a law of the 23rd August 1892, “to impart professional instruction, so as to prepare and form a body of men technically capable of directing the various operations connected with sugar factories, distilleries, and other industrial establishments indirectly connected with the farm.”

The school was established essentially to benefit the agriculture of the north of France, where the industries which it represents have attained a great development. It has been accordingly equipped, not only with large laboratories admirably adapted for experimental work, but also with the necessary machinery and plant to enable the students to learn and follow the practical work of each industry. The school, for instance, possesses a beet-root sugar factory, which can deal with more than nineteen tons of raw material every day, a distillery capable of making a daily quantity of alcohol amounting to 220 gallons; and a brewery which can produce over 250 gallons of beer at one time.

During the summer, the machinery is worked without being supplied with material, and simply as a means of instruction; in the winter, however, the work is carried on as in commerce. Frequent visits are made to typical farms in the neighbourhood, and arrangements are also made for the students to work temporarily in large private factories.

In addition to the regular course of instruction, it is the intention to provide further courses, as their need is felt, dealing with several other industries, such as the manufacture of starch, of various essences and perfumes, and of vegetable oils.

Independently of the ordinary students who are admitted on passing an entrance examination, the Douai School is also intended to receive men, who, having already passed through any other of the national schools, wish to obtain special technical training. There may also be admitted to the laboratories students who wish to study some particular subject, or to do special work connected therewith. Certain private persons may also be allowed to attend one or more of the courses of instruction.

The course of study for ordinary pupils lasts two years, but it may be reduced to one year in the case of those students who, as explained above, go to Douai only to complete their studies.

The *personnel* of the school consists of seventeen persons, including a director, eight professors, and four tutors. The students are non-residential, and the fees for instruction are fixed at 20*l.* (500 francs) per annum.

POTATOES AS FODDER FOR MILCH COWS.

There has recently been published in the "*Comptes Rendus de l'Académie des Sciences*," an account of researches conducted last winter by M. Charles Cornevin, at the suggestion of M. Aimé Girard, with a view to determine the effect of a potato diet on milch cows. It appears that when deprived of all other nutriment, milch cows will consume a daily quantity of potatoes—fed raw, suitably chopped up, and *ad libitum*—equal to 7 per cent. of their live weight. M. Cornevin finds that whilst this exclusive diet produces an increased flow of milk, it causes a considerable diminution in the live weight, and these changes are as distinct as they are remarkable. The excreta of the animals are relaxed and whitish, containing undigested starchy matter. No sugar is found in the urine.

Cooked potatoes are eaten readily enough by cattle; but, when these form the only food, rumination is either interrupted or ceases altogether, and the digestion is imperfect, so that the diet cannot be continued. According to M. Cornevin, potatoes, whether raw or cooked, must be mixed with other fodder so as to make a suitable ration for the production of both milk and meat. Such a mixture favours the mechanical and chemical processes of digestion, and raises the co-efficient of digestibility by making the nutritive ratio more in accord with the food requirements.

By a parallel series of experiments upon two lots of milch cows, one receiving a ration in which potatoes constituted 50 per cent., the other a ration in which they constituted only 22 per cent. of its total dry weight; M. Cornevin found the former ration to be clearly preferable to the latter. By means of other comparative experiments he further proved that, when supplied in equal quantities, raw potatoes favour the production of milk, while cooked potatoes promote fattening and increase the live weight.

Under the influence of a diet of which cooked potatoes forms the basis, the proportion of milk-sugar increases, but this increase ceases upon a change of food. By analysing each week during nearly four months, the milk obtained from eight cows fed upon a ration of 44 lbs. in one case, and in the other of 22 lbs. of potatoes, the following modifications were found to be constant. There was a diminution in the specific gravity of the milk in the proportions of dry matter and casein; but there was an increase of butter fat and also of mineral matters.

As regards the quantity of potatoes to be used as fodder for milch cows, M. Cornevin states that this must depend upon the object in view as regards the milk, whether it is to be sold in its raw state, or whether it is to be made into butter or cheese.

WHEAT GROWING IN RUSSIA.

The Consul General of the United States at St Petersburg has taken considerable pains to secure trustworthy information as to the probable extension of the wheat area in southern Russia during the next two or three years. An inquiry on the subject has been made by the heads of the departments of the Russian Ministry of Agriculture, and the result of this investigation is a report to the effect that it is absolutely impossible to make any definite estimate as to the future development of wheat growing in the empire. There are, it appears, so many adverse forces at work that it is considered doubtful if there will be any increase whatever in the acreage under the cereal in question during the next few years. In many instances, the soil is said to be so much exhausted that agriculturists have been advised to rotate the wheat crop less often than has been the custom in recent years. Again, it is claimed that the prices realised by the farmers have been of late very discouraging to them. During the last few years, especially, the discrimination in import duties against Russian cereals by Germany and Austria has tended to produce an unwholesome effect on Russian agriculture. But now that Russian grain is admitted on an equal footing with that of the most favoured nations, it is hoped that a stimulus will be given to the wheat-growing industry. It is feared, however, that the method so long in vogue amongst Russian farmers, of mortgaging grain to speculators or middlemen, will do more injury to the farming industry than will be offset by the advantages given to Russia under the new Russo-German treaty.

AGRICULTURAL LABOUR IN SEPTEMBER AND OCTOBER.

The October number of the "Labour Gazette" contains the usual monthly report by Mr. Wilson Fox, the Agricultural Correspondent of the Labour Department, upon the position of agricultural labour during the previous month. In this report the following statement appears, showing the average earnings per month of 26 days, of regular and extra farm labourers over 20 years of age employed in harvest work in different districts of England during the corn harvest of 1894.

The results are not put forward as necessarily typical of the whole but as true of 68 farms from which exact information was obtained. It should be noted that the earnings stated are cash payments, exclusive of all perquisites.

Harvest Wages, 1894.

District.	Number of Farms included in Returns.	Number of Men employed (exclusive of yearly paid Servants and of casual Men employed for a few days only).		Average Earnings per Month of 26 working Days during Corn Harvest 1894, for the Number of Men in preceding Columns.	
		Regular Men (but not yearly Men).	Extra Men.	Regular Men.	Extra Men.
				£ s. d.	£ s. d.
5 Northern Counties -	17	136	75	4 7 9	3 16 3
3 Midland " -	4	31	6	7 4 4	4 16 4
5 Eastern " -	33	554	56	6 11 1	7 4 2
5 Home " -	7	103	63	4 11 4	4 10 1
5 Western " -	7	74	—	5 6 5	—
Total and average -	68	898	200	5 18 5	5 0 3

It is observed that, in the North of England, the harvest wages are usually lower than in the other districts. This is partly because the north country labourer usually gets more perquisites, such as food, drink, and lodging, partly because the harvest is not usually undertaken by piece-work, and partly because he receives a higher and more uniform rate of wage throughout the year, which is supposed to represent a sufficient remuneration for any arduous services he may be called upon to perform at special seasons.

In the districts of Cambridgeshire, from which returns were received, the cost of harvest is said to have been unusually high, owing to the heavy crop being much laid by storms. Particulars are given in the report showing the cost of harvesting in the March district to have amounted to 19s. 10d. per acre.

In his October report Mr. Wilson Fox states that during that month employment had been generally obtained by agricultural labourers, owing to the heavy root crop, and also to there being a good deal of threshing work. It seems, however, that more men were in irregular work throughout the country in October 1894 than in the corresponding month of 1893.

In the North of England, where the number of odd men is comparatively small, owing to the hiring system, work was regular in Northumberland, Westmoreland, Cumberland, Cheshire, Yorkshire, and Derbyshire, but a few men in irregular work were reported in certain districts in Westmorland, Lancashire, and Yorkshire.

In the Midlands, some men were in want of work in Northamptonshire and Huntingdonshire, but generally employment in those counties and in Nottinghamshire, Leicestershire, Worcester-shire, and Rutland is said to have been satisfactory.

In the Home Counties of Oxfordshire, Berkshire, Buckingham-shire, Kent, Hertfordshire, Bedfordshire, Sussex, and Surrey,

employment was generally fair, but men in irregular work were reported in districts in Oxfordshire, Bedfordshire, Buckinghamshire, Kent, and Hertfordshire.

In the Eastern Counties, employment appears to have been very fairly good in Lincolnshire and Cambridgeshire, particularly in the root-producing districts. Men in Norfolk, Suffolk, and Cambridgeshire were reported out of employment in certain villages.

Employment in the Western Counties appears to have been normal in the counties of Gloucestershire, Monmouthshire, Herefordshire, Devonshire, and Cornwall, but in parts of Wiltshire, Dorsetshire, and Somersetshire employment has been irregular.

Weekly wages are reported to have generally dropped in October in all parts of the country in rural districts, except the Northern Counties, where they only fell in a few localities.

In some cases these changes were partly seasonal, but in most cases wages had fallen lower than they were at the corresponding period of 1893.

The fall of wages was most general in the corn growing counties of Lincolnshire, Cambridgeshire, Norfolk, Suffolk, and Essex. In the first-named county they are reported to have frequently fallen from 2s. 6d. or 2s. 3d. to 2s. In the winter of 1893, 2s. 3d. a day was usually the minimum wage. A wage of 2s. a day has not been so general in the county for six years. Wages in North Cambridgeshire had in many cases fallen from 13s. to 12s., and in South Cambridgeshire from 11s. to 10s.

In Essex wages were generally reduced 1s. a week in October, and in some cases 2s., the usual rate varying from 10s. to 12s., but in the Braintree district some labourers were receiving 9s. and even 8s.

The Norfolk wages were 11s. and 10s. In Suffolk wages were generally reduced to 10s., and in one village to 9s.

Wages in Wiltshire had in a number of districts been reduced from 11s. to 10s., and at Avebury they were 9s.

XV.—EXTRACTS FROM DIPLOMATIC AND CONSULAR REPORTS.

LIVE STOCK IN TEXAS.

In a report on the agricultural condition of Texas, Mr. H. D. Nugent, Her Majesty's Consul at Galveston, gives some interesting notes on the ranching industries of that State.

As is generally known, the sheep and cattle ranching industries of Texas are immense. The vast plains of the State afford unlimited pasture for both sheep and cattle, the chief drawback being want of water. Of late, ranching has been less profitable than formerly, and to-day a well-stocked sheep or cattle ranch can be bought for very much less than a few years ago. Notwithstanding this depression, the industry is a vast one, and the amount of capital invested enormous.

Texas stands at the head of the States of the Union in the number of her live stock. There are more sheep, more cattle, more horses and mules than in any other State or territory.

The total number of sheep in Texas in 1891 was 3,564,469, and in 1892, 3,366,257. The number has been decreasing for some years past, and the amount of wool clipped has diminished in proportion. In 1891, 2,978,459 sheep were sheared, yielding 15,499,979 lbs. of wool. In 1892, 2,539,054 sheep were sheared, the yield being 13,626,629 lbs. of wool. If the figures for 1888 were glanced at, it would be found that no less than 3,860,034 sheep were sheared, the amount of wool clipped being 18,721,693 lbs. These figures show the great decrease at present in the sheep ranching business.

The Texan sheep are chiefly the Spanish merino variety crossed with Mexican. Their average yield per head is about 5 lbs. per annum. They generally run in herds of about 1,500. Cotswold, Southdown, and Leicester sheep have from time to time been imported to try the effect of crossing them with the Texan sheep, but such experiments have never proved successful, as the imported sheep do not stand the climate, and will not "herd," as it is called.

The number of cattle in Texas, though still greater than in any other State, has also decreased of late years. In 1891, the number was 6,856,338, and in 1892, 6,337,428.

The stock is chiefly long horned Texas cattle, greatly improved by crossing with imported Durham, Jersey, and Holstein bulls.

Formerly it was the custom to allow the cattle to come to maturity here, and then ship, or drive, them for sale to Chicago. Nowadays they are taken when yearlings to the Indian Territory, Montana, and Wyoming, as it has been found that they gain much more weight at maturity when left a year or two in the colder climate of the above-named States.

The majority of the horses are of the kind known as "bronchos," the descendants of the wild horses of the plains, which stock is again derived from those brought over by Cortez. They are small, wiry, not much in appearance, but untiring and capable of covering great distances at their ordinary pace, which is a hand gallop or canter.

There are of course many horses of other breeds in Texas, especially in and near the towns, but the broncho is the Texan horse "par excellence." In 1891 there were 1,452,306 horses and mules in the State, and in 1892, 1,690,135, a considerable increase.

The mule is chiefly used for draught purposes owing to his superior height and strength.

In 1892 there were 12,972 donkeys, 268,390 goats, and 1 155,284 hogs in the State.

[*Foreign Office Report, Annual Series, No. 1431.*]

HORSE BREEDING IN AUSTRIA-HUNGARY.

In a recent report on the Agricultural Departments of Austria and Hungary, Mr. F. L. Cartwright, Second Secretary to Her Majesty's Embassy at Vienna, states that the duty of improving as much as possible the breed of horses reared in the country is one to which the Austrian Government attaches the greatest importance. The Ministry of Agriculture expends large sums yearly for this purpose; in the Budget for 1894 the estimate is put down at 150,000*l.*, or over one-third of the total expenditure of the Ministry for agricultural matters proper. The State stud is at Radautz, where, on an average, over 1,200 horses are kept. The report of 1888, moreover, mentions five State stallion depôts at Prague, Klosterbruck, Graz, Drobowyze, and Stadl. The Ministry also grants prizes for horse races, and subventions to societies and private individuals who keep stallions for breeding purposes.

The rearing of horses is in Hungary considered even more important than it is in Austria. The Hungarian Government, recognising the necessity of encouraging this source of national wealth, and also to insure the proper supply of horses for military purposes, expends, on an average, 400,000*l.* yearly in encouraging this branch of agriculture.

In Hungary, there are four State studs which supply stallions to the four State stallion depôts; these latter have dependent upon them 18 subsections scattered over the country. At the "covering" time, stallions are drawn from these depôts, and taken to "covering stations" erected in such districts as may be considered in need of them. In 1892 there were 884 parishes which were supplied with "covering stations."

CONSUMPTION OF BREADSTUFFS IN GERMANY.

Sir Charles Oppenheimer, Her Majesty's Consul-General at Frankfort-on-Main, has recently forwarded to the Foreign Office a Report on the Commercial Relations of Germany with Foreign Countries. In this report, it is stated that one of the economical effects of the recent commercial treaties has been to facilitate and cheapen the supply of breadstuffs in Germany; the industrial export being positively favoured partially by duty reductions on the part of foreign countries, and partially by the duties having been fixed so as to avoid new protective measures, which, whenever they are resorted to, create confusion in commerce and industry, and often curtail the latter for a length of time. The most important results of the Russo-German Commercial Treaty, which came into force on March 20, 1894, will, it is thought, probably be found to be the security now obtained against protective surprises, and the stability given to the customs laws of Europe for a period of 10 years. While it would be premature to give a definite verdict to-day as to whether the commercial treaties will actually accomplish what is hoped from them, nevertheless it seems as if the actual development is going on as was originally planned by the founders and advocates of this commercial-political work. In the former autonomous protective customs system of Germany, the weakest point was the high grain duties. It has been proved that the introduction of the grain duties, especially the raising of them to 2s. 6d. per cwt. in 1885, with the consequent rise in the prices of grain has successively reduced the grain, *i.e.*, bread consumption of the German population, and partially had the effect of causing an enlarged potato consumption to take its place; in fact, it impaired the conditions of sustenance for the population of Germany. The disclosure of this fact has not failed to have a deep effect, dearer bread and inferior quality of the people's food mean a fatal attack on the foundation of all industry, which surely is formed of a well-fed working population. The example of England, which at an early period did away with the corn duties for the benefit of her labouring population, is said to have exercised a stimulating influence on the free trade party in Germany. The new commercial treaties with their reduction in the grain duties from 2s. 6d. to 1s. 9d. per cwt. have only just come into force, and yet the statistics already tend to prove the fact that the consumption of bread and consequently the nourishment of the German population has increased. According to the official statistics, the quantity of wheat available for consumption in Germany during the 13 harvest years 1879-80 (*i.e.*, since the introduction of the grain duties) until 1891-92 (when the reduced grain duties came into effect) was on the average 2,898,147 tons per annum, and, in the harvest year 1892-93, the first year entirely under the influence of the reduced grain duties, the proportion of wheat remaining for the

consumption of the German population was 3,869,693 tons. This means an increase of 33 per cent. in the consumption. Furthermore, the average quantity of rye consumed in the 13 harvest years 1879-80 until 1891-92 was 6,271,841 tons, while that of the year 1892-93 was 6,965,000 tons, which gives an increase of 11 per cent. in the consumption. It is maintained that these figures would not be materially changed, if the transition year 1891-92 were left out of consideration.

Assuming that the German population increased by about 10 per cent. during the period under consideration (*i.e.*, the year 1892-93 as compared with the averages of the years 1879-80 to 1891-92), the consumption of rye has kept pace very nearly with this increase in the population, whereas the increase in the consumption of wheat is quite three times as great. From these *data* the conclusion is drawn (though with all the reservation necessary in such calculations) that as far as can be gathered from existing facts, the German population has increased its consumption of wheat, while that of rye has remained the same, so that, in general, the people now eat more bread and that, too, of a better quality.

[*Foreign Office Reports, Miscellaneous Series, No. 340.*]

AGRICULTURE IN ZULULAND.

Sir W. F. Hely-Hutchinson, the Governor of Zululand, in a Report to the Colonial Office, says that a good harvest was obtained in all parts of the territory during the year 1893, the season having been an exceptionally good one, and the total yield above the average. The natural pasturage of Zululand is excellent for cattle, and, in many localities, for sheep and horses.

The natives suffered considerable losses of stock from a disease known as "Nakana," which generally made its appearance in the districts unhealthy for man. An exhaustive inquiry was instituted as to the cause of this peculiar disease, and from the result of the investigation made it would appear that "Nakana" prevails only in the localities occupied by the larger species of game, and is associated with the presence of game by the natives.

Measures have consequently been taken with the object of confining the larger species of game to the most unhealthy and uninhabited parts of the country, where they will not come into contact with cattle and other stock.

The mortality amongst cattle from lung sickness was heavy in the Intonjaneni district, whilst the other districts were comparatively free from this disease. Owing probably to the heavy rainfall, horse sickness was unusually severe, especially in the Inkandhla district.

The natives continue to cultivate only to the extent of their own requirements, the crops grown at each kraal being no more than is sufficient for the food of its inmates. In the Inkandhla, Eshowe, and Nqutu districts, however, ploughs are now being bought, and in the latter district, which is chiefly inhabited by Basutos, grain is being extensively cultivated for sale, the plough being used at almost every kraal.

[*Annual Colonial Reports, No. 115 (C. 7319-13), Price, 1d.*]

AGRICULTURAL DEPRESSION IN OREGON.

In a report forwarded to the Foreign Office by Mr. Denis Donohoe, Her Majesty's Consul at San Francisco, it is stated that the year 1893 was probably the most unprofitable one that farmers have ever experienced in the State of Oregon, only fruit and hops having been profitable, for although crops were heavy, late and long continued rains during harvest caused a large amount of damage. In some sections of Eastern Oregon and Washington only a small proportion of the wheat crops were saved. This, and the fearfully low prices realised for sound wheat, ruined a great many farmers.

The acreage under hops is steadily increasing, and a large number of new yards will be in bearing next year. It is said to cost 4*d.* (8 c.) per lb. to grow and harvest them, and it is estimated Oregon will produce 50,000 bales in 1894, should the season prove favourable.

In view of the ruinous prices received for wheat there is a tendency to grow more largely such fruits as apples, pears, prunes, &c., which will bear transportation, and for which there is a steady demand. The yield of apples, pears, and prunes was heavy, but the peach crop was short on account of late frosts. Apples and pears were more free of moths than for some time past, and sold at full and profitable prices for the Eastern States. Prunes sold low. There was an over-production of small fruits which could only be sold locally, and in consequence much was wasted.

There was a very poor market for horses, and good graded animals were sold at very low prices. In consequence, numbers of breeders are going out of the business. There is hardly any demand now for horses for street cars, as electricity has superseded them. There is more demand for good, heavy draft horses than for any other class.

During the first half of the year fair prices were paid for beef cattle on the ranges, but they sold much lower in the last months of the year. The Union Meat Company bought and slaughtered about 20,000 cattle at an average price for the year of 6*l.* 12*s.* (33 dol.), which would be about 4*l.* on the ranges. The same company slaughtered about 6,000 calves at an average price of

1*l.* 10*s.* (7½ dol.). There was more profit in swine, and there will be a large increase in their products, as a large amount of water-damaged wheat at a low cost was available for feeding, and upon this they rapidly grow fat. The Union Meat Company slaughtered 15,000 at an average cost of 2*l.* 4*s.* The year was a most unprofitable one for sheep-owners, as prices of wool were ruinously low. There were 70,000 sheep slaughtered by the Union Meat Company which cost on an average for the year 9*s.* (2 dol. 75 c.) per head. At the close of the year sheep could be bought on the ranges at 6*s.*

[*Foreign Office Report, Annual Series, No. 1452.*]

AGRICULTURE IN FINLAND.

In his report to the Foreign Office on the trade of Finland, Mr. C. J. Cooke, Her Majesty's Vice-Consul at Helsingfors, says, that from an agriculturist's point of view, the year 1893 was a thoroughly good one, and had it not been for the unfavourable weather in August, it might have been put down as splendid, although the prices of corn, &c. continued very low, so that it has become a serious question whether it is not better to cease growing cereals at very little profit and to produce instead butter, &c., for the English market, as is being done more and more every year.

This circumstance goes far to explain the fact that Finland buys much rye from Russia and Germany, which latter country used formerly to import cereals from Finland. The causes of this great change are to be sought in the prohibition of exportation of all grain during the previous year from Russia generally, and in the over supply of European markets with American corn. The amount of cereals imported actually exceeded that of 1892, a year marked by a bad harvest in the whole of Finland, and by famine in the northern and eastern parts.

Next in importance to the export of timber is that of butter, which steadily increases in spite of the fact that in the early part of 1893 the ordinary route via Copenhagen was closed during the severe winter, and also owing to the great strike in England, which likewise had its effect.

The season was very favourable for potatoes, of which large quantities are consumed by the peasants.

The prohibition of exportation of cereals from Finland in 1892, had happily no ill effects so far as the Grand Duchy was concerned, so that oats were exported once more to the amount of 540,820 bushels, of which a portion went to England and the rest to Sweden and Norway.

The commencement of a trade in pressed hay and straw must also be noted. This was no doubt caused by the remarkable

fact that both England and France had little or nothing of the above products to spare; the trade having once begun, may be found worth continuing.

The prices of butter have been pretty good in spite of the fact that Australia has already come into the market, and promises to do so on a very much greater scale, as also Hungary, which is to be helped by its Government for the first 10 years by an export premium, but it is hoped that Finland will be able, by continuing to produce the very best article, to keep up its reputation and prices.

In connexion with the butter trade it may be mentioned that it is contemplated to provide the port of Hangö with another ice-breaker in order to avoid a stoppage of navigation similar to that which occurred in the winter of 1892-93.

[*Foreign Office Report, Annual Series, No. 1465.*]

THE ROTTERDAM OLEOMARGARINE TRADE.

Mr. Henry Turing, Her Majesty's Consul at Rotterdam, in a report to the Foreign Office on the trade of that city in 1893, states that the oleomargarine market experienced many and wide fluctuations during the year, caused in the first instance by moderate stocks in first, and small supplies in second hands, and advancing prices of neutral lard, which circumstances combined to bring about a speculative movement, and prices rose from 2*l.* 16*s.* 3*d.* to 3*l.* 7*s.* 6*d.* per cwt. within a very short period. This resulted in larger shipments from America, and with a sharp decline in the value of lard, coupled with dull markets for butter, prices soon experienced a fall to 2*l.* 12*s.* 6*d.* to 2*l.* 11*s.* 6*d.* for first and to 2*l.* 10*s.* to 2*l.* 9*s.* for second quality, at which rates manufacturers bought freely. The drought, which commenced in April and continued uninterruptedly till the first fortnight in July, caused prices of hay and other fodder to rise enormously, and hence it was feared that butter would become scarce and dearer, and the demand for margarine would thereby be considerably stimulated. Under this impression, prices for first qualities advanced to 2*l.* 18*s.* and 2*l.* 19*s.*, and a further considerable rise was looked for, when suddenly the financial crisis in the United States broke out, and holders of goods were forced to realise, causing values to recede to 2*l.* 11*s.* 6*d.* to 2*l.* 10*s.* 10*d.* A further decline was arrested through decreased shipments from America, but business remained quiet and was of little importance, the margarine manufacturers holding ample stocks of the raw material, whilst the strikes in the mining districts in England unfavourably influenced consumption. In October prices rose to 2*l.* 19*s.* 9*d.*, and in December the market closed at 2*l.* 15*s.* 6*d.*, with an upward tendency.

[*Foreign Office Report, Annual Series, No. 1446.*]

CONDITION OF AGRICULTURE IN ROUMANIA.

In a report dated September 19th, 1894, by Mr. Townley, relating to the condition of agriculture in Roumania, it is stated that at the present moment, although the first half of the financial year has shown a satisfactory surplus over the estimated receipts, there is much distress on account of the almost total failure of the harvest throughout Wallachia. Reports are constantly coming in representing the agricultural situation as getting daily worse and worse, and threatening complete ruin and destitution in many districts, which does not say much for the real wealth of the country if one bad year, following upon such an abnormally good one as last year, can produce such evil effects. Again, Roumanian grain is not, it appears, of a sufficiently good quality to justify expectations of a rise in its price so long as it has to contend with the far superior quality of the grain which is now being poured so abundantly into Europe from other parts of the world.

To prove the real nature of the distress which is threatening the agricultural classes of the country, attention is drawn to the circumstance that the peasants are selling their cattle in great numbers, and probably at a low price, since of late a considerable exportation of cattle has taken place to Russia; and this is believed to be due rather to the fact that the impoverished Roumanian peasant who wants money is obliged to sell at a price which the poor Russian peasant can afford to pay, than, as has been triumphantly alleged in the press, to an impetus having been given to the Roumanian cattle trade by the opening of a new market.

XVI.—PARLIAMENTARY PUBLICATIONS DEALING WITH AGRICULTURE.

Report of the Departmental Committee appointed by the Board of Agriculture to inquire into the Transit by Water and the Embarkation and Landing of Animals carried Coastwise. [C.-7511.] Price 3d.

The Board of Agriculture appointed a Departmental Committee on the 8th March 1894 to inquire and report whether any, and, if so, what amendments could with advantage be made in the regulations then in force under the provisions of the Contagious Diseases (Animals) Acts with regard to the transit by water and the embarkation and landing of animals carried coastwise.

In their Report, dated 7th August 1894, the Committee state that as the words of the remit did not exclude amendments in the regulations for which extended powers may be necessary, they did not consider themselves debarred from considering such amendments, even in cases where legislation may be necessary to give them effect, and in interpreting the words "embarkation and landing," they dealt with the remit as including the treatment of animals at the port of embarkation and after landing at the port of debarkation. They also considered it their duty to deal with a few matters which appeared intimately connected with the objects of their inquiry, although in strictness they might perhaps be considered to belong more immediately to the general law for the prevention of cruelty to animals.

The recommendations of the Committee are to the following effect:—

- (1.) That in order to secure the more effective control of the Government Departments concerned over the sea-borne Irish cattle trade, all vessels engaged in it should require a licence from these Departments, to be granted on the production of the certificate of the Board of Trade, on behalf of the Irish Privy Council, and to remain in force for the same period as that certificate, but revocable in case of offence against the regulations of the Irish Privy Council or the Board of Agriculture, and that the carrying of live stock in numbers above a low fixed maximum without such licence should be forbidden under a substantial penalty.
- (2.) That inspectors should be employed by the Departments, whose duties should include travelling in cattle ships and inspecting them while at sea.
- (3.) That owners of licensed ships should be required to make periodical returns of casualties occurring on board.
- (4.) That the regulations at present in force should be strengthened by the adoption of certain of those in

force in the Atlantic trade which relate to fittings and lighting.

- (5.) That, as in the Atlantic trade, the duty of ordering the slaughter of cattle seriously injured during the voyage should be imposed upon the master of the vessel.
- (6.) That ships' fittings likely to cause injury to cattle should be fenced off from the pens.
- (7.) That, as in the Atlantic trade, all fat cattle should be securely tied by the head.
- (8.) That the regulations regarding ventilation should be amended, and that certain regulations in force in the Atlantic trade should be extended to the home trade.
- (9.) That passage-ways below deck should be made compulsory, and the maximum length of pens reduced to 10 feet, but that in the case of ships now in the trade a reasonable time should be allowed to effect the change of present fittings.
- (10.) That the regulation against overcrowding of ships be amended so as to make it clear that it provides against the overcrowding of portions of ships and pens.
- (11.) That it is not desirable to interfere with voluntary arrangements as to the insurance or non-insurance of cattle carried by sea.
- (12.) That the gangways and the approaches thereto employed in shipping cattle should be under the control of the Departments, and that the shipping or unshipping of cattle, by gangways so steep as to involve danger or cruelty, be forbidden.
- (13.) That cattlemen be employed by shipowners, in addition to the ordinary crew, in sufficient number to attend to all the live stock on board.
- (14.) That drovers plying for hire at the principal ports of export and import be licensed by the local authority under the Contagious Diseases Animals Acts.
- (15.) That a goad of the pattern approved for driving animals be substituted for the stick in all cases.
- (16.) That as a condition to the embarkation of animals, in addition to a certificate of health, the veterinary inspector should be required to certify that in his opinion the animals to be shipped are in a proper condition, as regards absence of fatigue and recent feeding and watering, to undergo a voyage of the average duration of that which they are about to undertake, and that, in the case of cows in calf he should further certify that in his opinion the animals are fit to undertake the voyage without risk of inducing labour.
- (17.) That in all vessels, the average duration of whose voyage is 18 hours, food and water shall be provided for the cattle, and that arrangements shall be made to insure the cattle being properly fed and watered during the voyage.

- (18.) That the law relating to the prevention of cruelty to animals should be amended so as to make the protection afforded to animals on board ship co-extensive with that afforded to them on shore, and the practice of marking pigs by slashing their hides with knives should be discountenanced by prohibiting, after notice, the shipment of animals so marked.
-

Transit by Water of Animals carried coastwise, &c. Minutes of Evidence, with Appendices. [C.—7511.—I.] Price 2s.

This volume contains the evidence of 34 witnesses examined between the 20th March and the 2nd May 1894, by the Committee whose report is referred to in the foregoing article. The volume also contains 21 appendices, a copious index, and analysis of evidence.

Report from the Select Committee on Food Products Adulteration; together with the Proceedings of the Committee, Minutes of Evidence, Appendix and Index. [H.C.—253.] Price 2s. 4d.

This publication contains the report of the Select Committee appointed to inquire into the working of "The Margarine Act, 1887," and "The Sale of Food and Drugs Act, 1875," and any Acts amending the same, to which reference was made in the last number of this Journal (p. 106). The volume also contains the list of witnesses examined, and the minutes of evidence taken from the 3rd July to the 1st August, when the Committee made their report.

East India Wheat. Papers regarding the Impurity of Indian Wheat, and the Establishment of Warehouses for cleaning and grading Wheat, or for Storage. 1885-90. [C.—7440.] Price 9d.

This publication contains correspondence which originated with a circular letter, dated 16th May 1885, from the Government of India addressed to the local Governments, asking them to report, after conferring with the commercial public, on the question of the construction of warehouses near railway stations for storing and cleaning wheat, &c. intended for exportation.

East India Wheat. Papers relating to the Introduction into India of the System of Grain Elevators in vogue in the United States of America and in Canada. [C.—7441.] Price 9d.

This volume contains official and other information obtained by the Indian Governments regarding the introduction of grain elevators into India. The resolution embodying the decision of

the Government on the subject is dated 20th October 1893, and states that it has been acknowledged for some years past that the Indian wheat sold in England is very impure, and that both the bulk of the trade and the profits of the growers are injuriously affected in consequence.

In wheat exported from India, a considerable per-centage of extraneous matter has always been accepted by the trade. Up to 1889 the practice was that, on arrival in England, samples were taken from the various shipments, and an average quality was deduced from these by the Corn Trade Association and made generally known; and all the wheat sold during the month was represented as of "fair average quality." This system saved a great deal of trouble to home dealers, but it obviously placed no check on the amount of impurity that may be mixed with the imported wheat.

Owing to the system of threshing and storing wheat in India, and to the practice of sowing wheat mixed with other crops, a certain amount of impurity must always be found in the grain before it leaves the growers' hands; but a large portion of the impurities in Indian wheat sold in England is inserted intentionally after the grain has left the threshing floor. It was for some time contended that in order to stop the practice of intentional adulteration, Indian wheat should be subjected on arrival in England to some test of purity similar to that applied to other foreign wheats, and the Liverpool Chamber of Commerce arranged for a maximum "refraction" of 2 per cent. A conference was held by the Secretary of State for India in May 1889, and the London Chamber agreed to the principle involved so far as to fix rates for the various kinds of wheat; but the amount of impurity allowed still ranges from 4 to 7 per cent., and the Chamber have refused to reduce the per-centage.

So far, therefore, the attempt to induce the home dealers to move has been only partially successful. Dr. Voelcker, in his report on the improvement of Indian agriculture, states his opinion that, failing voluntary help from the trade, legislation may be found necessary, and various proposals have from time to time been made for the introduction of enactments to ensure the purity of exported wheat. The mercantile community are, however, averse to legislative measures, and the Government of India are of opinion that things have not reached a stage at which legislation would be justifiable.

The possibility of adopting a medium course by subsidising private enterprise, in order to secure the purity of wheat before it leaves the country, was presented to the Indian Government in December 1889. Though it was not the immediate object of the proposed company to introduce elevating machinery on any such complete plan as that adopted in America, they desired to test, at a few centres, the important practices of the American system, such as the cleaning of wheat by machinery, the grading of wheat by responsible officers, and the storing of wheat in safe and convenient places.

After duly considering the matter the Indian Government state that although they would be glad to see efforts made by private enterprise to provide cheap and convenient means of cleaning wheat, they would not feel justified in fostering trade in wheat any more than any other commercial ventures, by granting subsidies in support of private action.

As regards the *grading* of wheat, the system proposed required that grain received at the company's premises should be tested and divided into grades; that all grain of the same grade should be stored in the same warehouse; that the owner should be furnished with a certificate of the grading, which he might use as a negotiable instrument in place of transferring the actual wheat. Finally, the promoters of the scheme anticipated that, if proper precautions were taken, the certificates might be accepted by the home market, and that the uncertainty entailed by the present system be avoided.

The suggested scheme could not eliminate difficulties involved by adulteration or by damage from weevil *en route* to England; but, even if these were surmounted, it is feared that it would be found far less easy to work than in America or Russia, owing to the smaller scale of individual cultivation, the ultra conservative habits of both cultivators and middlemen, and the numerous varieties of wheat requiring classification. The Government could not consent either to allow their officers to countersign certificates made out by persons other than their own servants, or to provide official agency for the purpose of classifying grain. They are disposed to think that, if the scheme is to be worked at all, measures for the grading of wheat must be arranged by a combination of the leading merchants at the seaports.

It is doubtful, however, whether the mercantile classes in India would appreciate the advantages of public warehousing. Their instincts are apparently in favour of more confidential methods of dealing; their stocks are not, as a rule, collected at commercial centres, and their existing system of open air or pit storage is less expensive than, and, in the opinion of many, as effectual as, any public storage on advanced lines could be.

The Indian Government would therefore prefer to wait until the expansion of local and bonded warehouses under the charge of municipal and other bodies has familiarised the public with the warehouse system.

On the whole, therefore, the proposal that the State should subsidise a company for the cleaning, grading, and storing of wheat, or for any of these purposes, does not commend itself to the Government of India. They are unwilling to do anything that would stand in the way of the introduction either of the American elevator system, or of any modified form of it; but they hold, with most of the commercial associations consulted, that the promotion of such a system must be left to private enterprise, and that it cannot be introduced or subsidised by the State.

Board of Agriculture: Report on the Distribution of Grants for Agricultural Education in Great Britain in the Financial Year, 1893-94, with an Appendix. [C.-7495.] Price 6½d.

This volume is the annual report of the Board of Agriculture on the administration of the Parliamentary grant in aid of agricultural education in Great Britain, during the financial year ended 31st March 1894. Out of the total vote entrusted to the Board for educational purposes, the sum of 7,450*l.* was allocated in the form of specific grants to the several institutions mentioned below. The balance was devoted to the necessary costs of inspection, including inspection of certain county council work, and to the special outlay incurred in the reproduction of the complete series of records of the Rothamsted experiments for the past 50 years. An Appendix reproduces summaries of various reports on institutions aided and contains a record of certain field experiments aided out of the vote, and a report on special research in the processes of Cheddar-cheese making.

The following is a list of grants awarded by the Board of Agriculture in 1893-4:—

Institutions aided.	Work.	Grant 1893-4.
ENGLAND AND WALES.		£
University College of North Wales, Bangor	Collegiate centre - -	800
Yorkshire College, Leeds - - -	Collegiate centre - -	800
Durham College of Science, Newcastle-on-Tyne.	Collegiate centre - -	800
University College of Wales, Aberystwyth -	Collegiate centre - -	700
Cambridge and Counties Agricultural Education Committee.	Collegiate centre - -	400
University College, Nottingham - - -	Collegiate centre - -	200
University Extension College, Reading - -	Collegiate centre - -	150
Bath and West and Southern Counties Society.	Special Cheese research and Agricultural experiments.	400
Eastern Counties Dairy Institute - -	Dairy Instruction - -	350
British Dairy Farmers' Association - -	Dairy Instruction - -	250
SCOTLAND.		
Glasgow and West of Scotland Technical College.	Collegiate centre - -	600
University of Edinburgh - - - -	{ Agricultural instruction Forestry class -	450
University of Aberdeen - - - -		100
Scottish Dairy Institute, Kilmarnock - -	Agricultural instruction	200
Highland and Agricultural Society - -	Dairy instruction - -	250
Aberdeen Agricultural Research Association	Agricultural experiments	200
Dounby Science School, Orkney - - -	Agricultural experiments	100
		25
SPECIAL CLASSES.		
Class for the higher instruction of Dairy Teachers engaged under local authorities and institutions.	- - - - -	175
Class for the instruction of Working Foresters and Gardeners in the Royal Botanic Garden, Edinburgh.	- - - - -	150

Agricultural Statistics of Ireland with detailed Report on Agriculture for the Year 1893. [C.—7531.] Price 1s. 3d.

This publication is the annual report prepared by the Registrar-General in Dublin, and contains information relating to Ireland, for the year 1893, as regards division of land; acreage under crops; number and size of holdings; number of occupiers of land; woods and plantations; rates of produce; average prices of agricultural produce; noxious insects; number, ages, &c. of live stock; diseases of cattle; exports and imports of live stock; dairy industries; honey produced; number of scutching mills; number of corn mills; silos and ensilage; forestry operations; agricultural schools; wages of agricultural labourers; loans for labourers' dwellings; and observations on the produce of the crops.

In a table contained in the report, it is shown that the number of dairy factories from which statistics were obtained was 190, being an increase of 15 as compared with the number returned in 1892, and that the number of hands permanently employed amounted to 1,443, or 199 more than in the previous year.

Of the 190 factories, 95 were owned by individual proprietors, 49 were the property of joint stock companies, and 46 belonged to co-operative farmers; 169 dealt with cream only, 4 with cream only, and 17 with both milk and cream.

In the 190 factories there were 419 milk separators, of which 357, or 85 per cent., were worked by steam-power. Almost four-fifths of the total number were in Munster, the number for that province being 151; there were 33 in Leinster, 4 in Ulster, and 2 in Connaught.

The quantities of milk and cream supplied to the factories during the year ended 30th September 1893 is given as 64,107,418 gallons of the former, and 809,422 of the latter, 278,492 gallons of cream being again sold as such. The quantity of butter produced during the same period was 160,845 cwts. (against 141,573 cwts. in the preceding year); 183 cwts. of skim-milk cheese; and 15,154,700 lbs. of condensed milk.

The skim milk was returned to the farmers by 162 factories, and it was otherwise disposed of in the remaining establishments.

Agricultural Statistics, Ireland, 1894. Report and Tables relating to Migratory Agricultural Labourers; showing their distribution in Ireland when at home; their relative proportion to the population; their social position when at home as measured by the extent of their holdings, if any; their destination; and the number who left the several ports from 1st January to 31st August 1894. [C.—7533.] Price 2½d.

This Report shows that there were 15,615 migratory agricultural labourers in Ireland during the above period, and that

13,474 of these usually reside in the province of Connaught. Of the total number, 82·6 per cent. sought work in England, 14·7 per cent. in Scotland, and 2·7 per cent. in Ireland.

Agricultural Statistics, Ireland, 1894. General Abstract showing the Acreage under Crops, also the Number and Description of Live Stock in each County and Province, 1893-94. [C.—7530.] Price 2½d.

This is the annual Abstract Return relating to agriculture issued by the Registrar-General in Dublin. It shows that the total extent under crops in 1894 is 4,937,179 acres, being a net increase on the extent in 1893 of 59,138 acres, or 1·2 per cent. There was an increase in Ulster of 25,138 acres, or 1·5 per cent.; in Leinster of 22,239 acres, or 1·7 per cent.; in Munster of 9,240 acres, or 0·8 per cent.; and in Connaught of 2,521 acres, or 0·4 per cent.

In 1893 the extent returned under grass was 10,321,107 acres, in 1894 the amount returned is 10,205,107 acres, being a decrease of 116,000 acres; the extent returned as fallow in 1893 was 21,875 acres, and in 1894, 19,639 acres; the extent under woods and plantations in 1893 was 307,386 acres, against 311,224 acres in 1894; and the extent returned under "Turf, Bog, Marsh, Barren Mountain Land, &c.," in 1893 was 4,804,935 acres, against 4,860,195 acres in 1894, being an increase of 55,260 acres; of the acreage thus returned in 1894, 1,230,032 acres have been entered by the enumerators as turf bog, 451,061 acres as marsh, and 2,237,748 acres as barren mountain land.

The acreage under cereal and green crops in 1894 is shown as follows:—

—	Acres.	—	Acres.
Wheat - - - - -	49,342	Potatoes - - - - -	717,120
Barley - - - - -	164,604	Turnips - - - - -	311,294
Oats - - - - -	1,254,813	Mangel-wurzel and beetroot	52,023
Bere and Rye - - -	13,656	Cabbage - - - - -	44,512
Beans and Peas - - -	3,605	Vetches - - - - -	10,818
		Carrots, parsnips, and other green crops - - - - -	27,510

Compared with 1893 there appears a decrease of 5,656 acres in the acreage under wheat; an increase of 6,475 acres under oats; a decrease of 4,172 acres under barley; a decrease of 1,559 acres under bere and rye, and a decrease of 420 acres under beans and peas, showing a net decrease of 5,332 acres in the extent under cereal crops.

The acreage under turnips has increased by 8,520 acres; mangel-wurzel and beetroot by 4,989 acres, and cabbage by 3,276 acres. The extent under potatoes has decreased by 6,615 acres; vetches and rape by 233 acres, and carrots, parsnips, and

other green crops by 368 acres, leaving a net increase of 9,569 acres in the extent under green crops.

The acreage under flax in 1893 was 67,487 acres, and in 1894 the extent returned under this crop is 100,851 acres, being an increase of 33,364 acres.

In the returns the area under meadow and clover is shown as the extent "For Hay only," subdivided under the headings "Clover, sainfoin, and grasses under rotation" and "Permanent pasture, or grass not broken up in rotation." The extent for hay under "Clover, &c.," in 1893 was 642,355 acres, and in 1894 it is 641,043 acres, being a decrease of 1,312 acres. The area for hay on permanent pasture in 1893 was 1,525,118 acres, and in 1894 it is 1,547,967 acres, showing an increase of 22,849 acres. There is, therefore, an increase of 21,537 acres in the total area under meadow and clover.

As regards the returns of live stock, it appears that between 1893 and 1894 there has been an increase of 9,638 in the number of horses and mules; and an increase in the number of pigs amounting to 236,893. Cattle exhibit a decrease of 71,863, and sheep a decrease of 316,205. Of the 16,179,897 poultry enumerated in 1894, 1,011,591 were turkeys, 2,082,005 were geese, 2,838,071 were ducks, and 10,248,230 were ordinary fowl.

Royal Commission on Labour. The Agricultural Labourer, Vol. V., Part 1. [C.—6894.—XXV.] Price 2s. 1d.

This volume contains the general report by Mr. William C. Little (Senior Assistant Agricultural Commissioner) dealing with the inquiry into the condition of the agricultural labourer in different parts of the United Kingdom, which has been carried out under the direction of the Royal Commission on Labour.

In this general report Mr. Little describes the nature and scope of the inquiry; the method which has been pursued; the area which has been surveyed; the characteristic features of the several districts of inquiry; and finally, the conclusions which may be drawn from the information and evidence which has been obtained.

Mr. Little has already summarised the conclusions in his Review of the Inquiry, which was published in Part I. of the Fifth and Final Report of the Royal Commission on Labour, and reviewed in detail in No. 1 of this Journal. In the present volume these conclusions are stated at greater length, and supported by extracts from the reports of Mr. Little's colleagues.

Report of the Committee of Council on Education in Scotland with Appendix, 1893-94. [C.—7431.—I.] Price 2s. 5d.

This report states that during the year 1893 the number of scholars on the registers of inspected schools was 664,838. Examinations were held in the principles of agriculture under

Article 21 of the Code of the Scotch Education Department. Of 2,825 boys who were examined in the first stage of this subject, 2,409 passed; in the second stage there were 1,332 pupils examined and 1,163 passes; and in the third stage 1,385 presentations and 1,177 passes; or a total of 5,542 candidates, of whom 4,749 were successful.

It is stated in the report that one cause, of old standing, why many country children are late in reaching the higher standards, if indeed they ever reach them, is to be found in the migratory habits of the farm servants. It is a proverb in Berwickshire that—

“For a hen’s gerse,
They’ll flit i’ the Merse,”

and it is undoubtedly the case that agricultural labourers, all over the border district, change from one farm to another for a very slight inducement, or merely because they find the excitement of a flitting to be a pleasant break in the monotony of their lives. When the parents leave the parish in May they take their children with them, and very often these children are not sent to the new school until it opens, at the end of September, after the harvest. Meanwhile, they have forgotten much, and the new teacher does not find it possible to get them ready to pass a new standard before the inspection in the following spring.

Return made to the Department of Science and Art showing the manner in which, and the extent to which, the Councils of Counties and County Boroughs in England and Wales, and the County Councils, Town Councils, and Police Commissioners of Police Boroughs in Scotland, are devoting funds to the purposes of Science, Art, Technical, and Manual Instruction, under the Local Taxation (Customs and Excise) Act, 1890; Technical Instruction Acts, 1889 and 1891; and the Technical Instruction Amendment (Scotland) Act, 1892. [C.—7463.] Price 10½d.

The return shows that the total amount expended on technical education during the year 1892–93, in England, Wales, and Scotland, was 529,718*l.* 3*s.* 4*d.*; and that the estimated total amount allocated to technical education for the year 1893–94 was 696,328*l.* 4*s.* 4*d.*

A summary is given showing that 41 out of the 49 county councils in England (excepting the county of Monmouth) are applying the whole of the residue received under the Local Taxation (Customs and Excise) Act, 1890, to technical education, while eight apply a part of it to the same purpose. Of the councils of the 61 county boroughs, 53 are devoting the whole of the residue to technical education, and seven a part of it; while in one case only (the county borough of Preston) the

residue is being applied, not to educational purposes, but to relief of rates. In addition, the councils of 10 county boroughs are levying a rate, or making grants out of the rates, under the Technical Instruction Acts.

The 13 county councils and the councils of the three county boroughs in Wales and Monmouth are devoting the whole of the residue to intermediate and technical education, chiefly under the Welsh Intermediate Education Act, 1889. In addition, the councils of six counties and county boroughs are levying a rate, or making grants out of the rates, under the Technical Instruction Acts. The estimated total amount to be devoted annually to intermediate and technical education in Wales and Monmouth, under the Welsh Intermediate Education Act, 1889, is 42,861*l.* In some cases the amount allocated by the councils each year out of the residue received under the Local Taxation (Customs and Excise) Act, 1890, is accumulating, as the schemes submitted to the Charity Commissioners are not yet in operation, and in these cases the levying of the rate under the Welsh Act is in the meantime deferred.

In the case of Scotland, 23 out of the 33 county councils are applying the whole of the residue to technical education, and seven a part of it only, while one has the matter under consideration, and two are applying the residue to the relief of rates. Of 194 burghs and police burghs, 21 are applying the whole, and 50 a part, of the residue to technical education; one has not decided; and 122 are applying the whole to the relief of rates. The latter number, however, includes a few cases in which it is probable that the residue will be applied to technical education.

United States Tariff: Return respecting the Customs Tariff of the United States; containing a complete Statement of the Rates of Import Duty leviable under the New Tariff Act passed by Congress on the 14th August 1894, compared with those which were previously leviable under the Tariff Act of 1890, and various Statistical Tables relating to the present and past Tariffs, the Imports into, and Exports from, the United Kingdom in its Trade with the United States, etc. [C.-7579.] Price 9d.

This return has been published by the Commercial Department of the Board of Trade. The volume contains a comparative statement showing the rates of import duty leviable under the present and previous Customs Tariffs of the United States, the remaining provisions of the Tariff Act of 1894; and numerous statistical tables.

XVII.—PRICES OF LIVE STOCK AS RETURNED UNDER
THE MARKETS AND FAIRS (WEIGHING OF
CATTLE) ACT, 1891.

Information is collected weekly by the Board of Agriculture under the provisions of the Markets and Fairs (Weighing of Cattle) Act, 1891, respecting the numbers of cattle, sheep, and swine entering the 19 places in Great Britain, scheduled under the Statute, as to the number, weight, and prices of animals weighed in the markets or auction marts to which the provisions of the Act apply.

The following data, abstracted from the returns received, are now furnished in continuation of the statistics laid before Parliament for the year 1893, in the paper entitled Prices of Live Stock, C.-7314, and of the tables for the first half of 1894 published in the September number of this Journal.

In the 19 places mentioned in the Act, the total number of cattle, sheep, and swine, respecting which particulars were supplied in the returns rendered during the three months ending 30 September 1894, contrasts as under with the information for the similar period of the previous year :—

Animals.				Third Quarter, 1893.	Third Quarter, 1894.
CATTLE :				No.	No.
Entering markets	-	-	-	281,126	279,586
Weighed	-	-	-	21,334	20,611
Priced -	-	-	-	19,706	18,408
SHEEP :					
Entering markets	-	-	-	1,648,764	1,502,874
Weighed	-	-	-	10,076	9,278
Priced -	-	-	-	8,421	6,526
SWINE :					
Entering markets	-	-	-	42,110	20,676
Weighed	-	-	-	318	743
Priced -	-	-	-	123	157

Of the 20,611 cattle weighed in the quarter, 15,078 were reported from the Scotch markets alone. The number of sheep weighed in England and Scotland were more nearly equal.

The aggregate number of animals entering the scheduled markets, and the number returned as weighed and priced during the first nine months of the current year, may be compared with the similar details for the corresponding period of 1893, as under :—

Animals.	Nine Months ending 30 Sept. 1893.	Nine Months ending 30 Sept. 1894.
CATTLE : Entering markets - - - - Weighed - - - - Priced - - - -	No. 884,021 68,702 62,520	No. 856,969 68,522 62,093
SHEEP : Entering markets - - - - Weighed - - - - Priced - - - -	3,875,214 30,691 22,847	3,730,907 32,372 21,226
SWINE : Entering markets - - - - Weighed - - - - Priced - - - -	138,431 915 258	90,215 1,693 280

The total number of cattle coming forward to market in the 19 scheduled towns appears thus to have been somewhat less than in the same portion of 1893, the number of cattle weighed and priced being also very slightly less. The total of sheep weighed was less in the three months, but a greater number were weighed in the nine months, although rather fewer prices, both in the shorter and longer periods, were recorded. Of pigs a much smaller total is recorded as entering the markets, less than half in the latest quarter's figures. The proportion weighed was, however, considerably greater, and a few more prices were obtained this year than last.

The table on the following page furnishes the details reported from each market during the third quarter of 1894, and it may be well to again direct attention to the small extent to which owners of live stock are making use of the facilities secured by the Cattle Weighing Acts of 1887 and 1891 for the better conduct of their business. In England it appears that, except in the markets of London and Liverpool, the numbers weighed are altogether insignificant. No cattle at all are reported as weighed at Birmingham, Bristol, or Lincoln during the quarter, and although a few were weighed at Leeds and at Wakefield, the authorities of these markets have been again quite unable to furnish any quotations of prices.

The reports from Glasgow are almost equally defective. As regards sheep, the practice of weighing appears to attain considerable dimensions in only two English and two Scotch markets.

TOTAL NUMBER of Cattle, Sheep, and Swine, entering the MARKETS and MARTS of the under-mentioned Places in ENGLAND and SCOTLAND, with the Number WEIGHED, as received from the Market Authorities in the Third Quarter 1894, under the Markets and Fairs (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	Cattle.			Sheep.			Swine.		
	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.
ENGLAND.	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>
Ashford - - -	3,571	15	12	36,335	—	—	1,608	—	—
Birmingham - -	5,982	—	—	39,403	—	—	—	—	—
Bristol - - -	25,006	—	—	53,230	—	—	—	—	—
Leicester - - -	14,897	141	135	33,312	41	41	494	—	—
Leeds - - -	8,320	136	—	34,900	41	—	1,553	580	—
Lincoln - - -	2,092	—	—	19,392	—	—	628	—	—
Liverpool - - -	20,158	1,167	1,167	168,993	1,100	1,100	—	—	—
London - - -	22,895	3,453	1,712	221,640	2,918	418	—	—	—
Newcastle-upon-Tyne	24,191	126	126	118,456	10	—	6,270	154	†154
Norwich - - -	21,051	52	52	64,394	—	—	3,365	—	—
Salford - - -	34,795	86	86	227,700	8	8	142	—	—
Shrewsbury - - -	7,286	301	116	32,809	—	—	492	6	—
Wakefield - - -	26,855	43	—	60,973	9	—	—	—	—
York - - -	10,095	13	13	57,504	—	—	304	—	—
SCOTLAND.									
Aberdeen - - -	12,638	3,511	3,511	75,093	3,615	3,595	3,539	—	—
Dundee - - -	4,027	2,158	2,090	7,216	137	57	368	3	3
Edinburgh - - -	15,239	7,184	*2,778	60,462	—	—	1,467	—	—
Glasgow - - -	7,396	80	80	138,332	38	30	270	—	—
Perth - - -	13,092	2,145	*338	52,730	1,361	1,277	176	—	—
TOTAL for ENGLAND	227,194	5,533	3,419	1,169,041	4,127	1,567	14,856	740	†154
TOTAL for SCOTLAND	52,392	15,078	*8,797	333,833	5,151	4,959	5,820	3	3
Total - - -	279,586	20,611	*12,216	1,502,874	9,278	6,526	20,676	743	†157

* Prices for 4,385 cattle in addition to the above were quoted from Edinburgh, and for 1,807 cattle from Perth, but without distinguishing breed or quality.

† Prices given but details insufficiently furnished.

‡ The details for 3 swine only were furnished in the form prescribed.

The number of cases in which the authorities and auctioneers have been able to supply particulars of price is still far from satisfactory. As the table just presented indicates, the largest number of quotations, in proportion to the total instances where use was made of the weighbridge, come from Liverpool, Aberdeen, and Dundee. In London prices were got for about half the number of cattle weighed, but for less than one in seven of the number of sheep. In Edinburgh and Perth the returns are again defective in form for the construction of an average result.

The returns supplied from the five markets, whence alone sufficiently numerous particulars of prices of cattle have been rendered for the latest quarter, show the following range of prices, during the three months ended 30th September last:—

Places.	Third Quarter of 1894.		
	Inferior or Third Quality.	Good or Second Quality.	Prime or First Quality.
ENGLAND:	Per Cwt.	Per Cwt.	Per Cwt.
Liverpool - - -	—	29s. 6d.	33s. 6d.
London - - -	21s. 4d. to 31s. 6d.	33s. 0d. to 36s. 4d.	36s. 4d. to 40s. 4d.
SCOTLAND:			
Aberdeen - - -	24s. 0d. to 26s. 6d.	24s. 0d. to 36s. 6d.	30s. 10d. to 39s. 2d.
Dundee - - -	24s. 0d. to 30s. 0d.	30s. 10d. to 33s. 6d.	30s. 0d. to 36s. 0d.
Edinburgh - - -	27s. 6d.	29s. 4d. to 35s. 0d.	35s. 4d. to 38s. 0d.

As indicated on a former occasion, in order to obtain an average quotation of prices, the aggregate of the local prices realised at each of the five markets above named must be divided by the total live weight recorded. If this calculation be made, the following is the result for each of three quarters of the current year, 1894:—

Places.	First Quarter.			Second Quarter.			Third Quarter.		
	Inferior or Third Quality.	Good or Second Quality.	Prime or First Quality.	Inferior or Third Quality.	Good or Second Quality.	Prime or First Quality.	Inferior or Third Quality.	Good or Second Quality.	Prime or First Quality.
ENGLAND:	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.
Liverpool -	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Liverpool -	—	28 0	33 4	—	28 6	34 4	—	29 6	33 6
London -	29 10	35 2	39 2	26 6	36 2	38 6	23 0	33 10	38 6
SCOTLAND:									
Aberdeen -	24 8	31 11	36 4	25 4	32 2	36 4	24 5	32 7	36 9
Dundee -	25 11	31 11	34 3	27 1	32 0	34 2	27 1	31 9	34 3
Edinburgh	24 11	33 6	34 8	—	33 8	33 10	27 6	33 11	36 0

The details of the prices quoted for each of the breeds and classes of animals (actual sales for live weight being distinguished) on which these averages are based are shown in the following tables:—

NUMBER and PRICES of **Cattle** WEIGHED in the under-mentioned Places in
Third Quarter of 1894, under the Markets and Fairs

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
ENGLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Liverpool -	Irish Cross Bred -	—	—	—	333	3 8½	29 6	834	4 2½	33 6
London -	Devons - - -	—	—	—	—	—	—	11	4 10½	39 2
	Herefords - - -	—	—	—	80	4 4½	34 10	378	4 10	38 8
	Herefords* - - -	—	—	—	17	4 3	34 0	43	4 10½	39 0
	Highland Scots -	—	—	—	12	4 3½	34 6	—	—	—
	Irish Shorthorns -	—	—	—	12	4 5½	35 10	7	4 6½	36 4
	Irish Shorthorns* -	—	—	—	50	4 4	34 8	14	4 6½	36 4
	Lincoln Shorthorns	—	—	—	14	4 6	36 0	17	4 8½	37 8
	Lincoln Shorthorns*	—	—	—	—	—	—	20	4 7½	36 10
	Norfolks - - -	—	—	—	8	4 6½	36 2	14	4 8½	37 10
	Polled Scots - - -	—	—	—	21	4 6½	36 4	86	5 0½	40 4
	Polled Scots* - -	—	—	—	—	—	—	19	4 11½	39 6
	Runts - - -	10	3 11½	31 6	53	4 3	34 0	74	4 8½	37 8
	Runts* - - -	—	—	—	16	4 1½	33 0	12	4 6½	36 4
	Scotch Shorthorns -	—	—	—	—	—	—	20	4 9½	38 6
	Scotch Shorthorns*	—	—	—	—	—	—	4	5 0	40 0
	Shorthorns - - -	111	2 9½	22 2	183	4 1½	33 2	65	4 8	37 4
	Shorthorns* - - -	6	2 8	21 4	318	4 1½	33 2	17	4 7	36 8

* Sold by Live Weight.

ENGLAND and SCOTLAND, as received from the Market Authorities in the (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
SCOTLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Aberdeen.	Cross Bred -	652	3 0	24 0	1,606	4 0½	32 4	606	4 7	36 8
	Polled -	69	3 3½	26 2	109	4 3½	34 6	101	4 8½	37 8
	Polled Angus -	53	3 3½	26 6	156	4 6½	36 6	31	4 10½	39 2
	Irish (Stores) -	—	—	—	97	3 0	24 0	31	3 10½	30 10
Dundee.	Cross Bred Polled -	8	3 4½	27 0	178	3 11½	31 10	156	4 3½	34 4
	Cross Bred Polled* -	—	—	—	15	4 0	32 0	33	4 5	35 4
	Cross Bred Short-horns.	37	3 6	28 0	202	3 11½	31 10	140	4 3½	34 2
	Cross Bred Short-horns.*	—	—	—	2	3 10½	30 10	11	4 5	35 4
	Highland -	1	3 0	24 0	—	—	—	—	—	—
	Irish Cross Bred -	22	3 2	25 4	596	3 11½	31 8	523	4 3½	34 4
	Irish Cross Bred* -	—	—	—	8	4 2½	33 6	61	4 3½	34 2
	Polled Angus -	5	3 9	30 0	1	4 1½	32 10	—	—	—
	Polled Angus* -	—	—	—	—	—	—	11	4 6	36 0
	Welsh Runts -	—	—	—	—	—	—	8	4 3½	34 2
	West Highland -	11	3 3½	26 4	19	3 11	31 4	26	4 4	34 8
	West Highland* -	—	—	—	—	—	—	5	4 4½	35 0
	Irish (Stores) -	—	—	—	—	—	—	11	3 9	30 0
Edinburgh	Black Polled Gallo-ways.	—	—	—	—	—	—	4	4 6	33 0
	Cross Bred -	—	—	—	2,512	4 3	34 0	—	—	—
	Polled Angus -	—	—	—	5	4 4½	35 0	10	4 5½	35 10
	Shorthorns -	9	3 5½	27 6	56	4 0	32 0	58	4 5	35 4
	Shorthorns* -	—	—	—	8	4 0	32 0	38	4 6½	36 6
	West Highland* -	—	—	—	—	—	—	8	4 9	38 0
	Irish (Stores) -	—	—	—	10	3 9½	30 2	—	—	—
	Irish (Stores)* -	—	—	—	40	3 8	29 4	—	—	—
	Irish Polled (Stores)	—	—	—	17	3 9	30 0	—	—	—
	Irish Shorthorns (Stores).*	—	—	—	3	4 1½	33 0	—	—	—

* Sold by Live Weight.

The number and prices of **Sheep** reported as weighed under the Markets and Fairs (Weighing of Cattle) Act, 1891, in the under-mentioned places in the **Third Quarter** of 1894 are shown in the following table:—

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals		Average Price.	Animals		Average Price.	Animals		Average Price.
		Weighed.	Per Stone.	Per Cwt.	Weighed.	Per Stone.	Per Cwt.	Weighed.	Per Stone.	Per Cwt.
ENGLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Liverpool	Irish Cross Bred -	—	—	—	1,100	5 5½	43 6	—	—	—
London -	Downs* - - -	—	—	—	—	—	—	20	5 7½	44 10
	Half-Bred - - -	10	4 2	33 4	145	5 1	40 8	10	5 7½	45 0
	Half-Bred* - - -	—	—	—	203	5 2½	41 8	—	—	—
	Southdowns - -	—	—	—	—	—	—	30	6 1½	49 2
SCOTLAND:		—	—	—	—	—	—	73	4 4½	35 2
Aberdeen	Black Face Wethers -	—	—	—	—	—	—	35	4 4½	35 0
	Cheviot Wethers -	—	—	—	1,697	3 10	30 8	1,565	4 7½	36 10
	Cross Bred - - -	—	—	—	19	4 7½	37 0	140	4 7½	36 10
	Grey Face Hoggs -	—	—	—	20	4 9	38 0	46	4 9	38 0
	Half Bred Hoggs -	—	—	—	—	—	—	—	—	—
Perth -	Black Face Ewes -	7	3 4½	26 10	50	4 0	32 0	40	4 1½	33 0
	Black Face Wethers -	12	3 8	29 4	25	4 2	33 4	—	—	—
	Cheviot Ewes - -	—	—	—	20	3 11	31 4	—	—	—
	Cross Bred Hoggs -	40	4 3½	34 2	203	4 6	36 0	862	4 8	37 4
	Half Bred Ewes -	—	—	—	18	2 11½	23 6	—	—	—

* Sold by Live Weight.

XVIII.—STATISTICAL TABLES.

I.—PRICES OF LIVE AND DEAD MEAT.

AVERAGE PRICES OF DEAD MEAT, per Stone of 8 lbs., at the
LONDON CENTRAL MEAT MARKET, during the First, Second,
and Third Quarters of 1894.

(Compiled from the prices quoted weekly in the *Meat Trades Journal*.)

DESCRIPTION.	1ST QUARTER.	2ND QUARTER.	3RD QUARTER.
BEEF:—	<i>s. d. s. d.</i>	<i>s. d. s. d.</i>	<i>s. d. s. d.</i>
Scotch, short sides - -	4 0 to 4 4	4 2 to 4 6	4 4 to 4 7
„ long sides - -	3 8 „ 3 11	3 9 „ 4 0	3 10 „ 4 1
English, Prime - -	3 8 „ 4 0	3 8 „ 4 0	3 10 „ 4 1
Cows and Bulls - -	2 5 „ 3 0	2 5 „ 2 10	2 4 „ 2 10
American, Birkenhead killed -	3 3 „ 3 6	3 1 „ 3 4	3 0 „ 3 4
„ Deptford killed -	3 3 „ 3 7	3 1 „ 3 5	3 1 „ 3 6
„ Refrig. hind-qrs. -	3 0 „ 3 7	3 1 „ 3 7	3 2 „ 3 10
„ „ fore-qrs. -	2 3 „ 2 6	1 10 „ 2 2	1 9 „ 2 2
Danish sides, best - -	2 6 „ 3 0	2 6 „ 2 11	—
„ „ seconds - -	2 0 „ 2 3	2 0 „ 2 4	—
MUTTON:—			
Scotch, Prime - -	4 0 „ 4 5	4 6 „ 4 11	4 8 „ 5 1
„ Small Tegs - -	4 6 „ 4 9	—	—
English, Prime - -	3 11 „ 4 4	4 3 to 4 9	4 6 „ 4 11
Ewes - -	3 3 „ 3 7	3 9 „ 4 0	3 7 „ 4 0
Merinos - -	3 9 „ 3 11	4 2 „ 4 3	—
Dutch - -	3 5 „ 3 10	4 1 „ 4 5	} 4 1 to 4 5
German - -	3 3 „ 3 10	4 3 „ 4 6	
New Zealand - -	2 10 „ 3 1	2 9 „ 3 0	2 3 „ 2 7
Australian - -	2 5 „ 2 8	2 4 „ 2 6	1 11 „ 2 2
River Plate, Frozen - -	2 4 „ 2 6	2 1 „ 2 3	1 9 „ 2 0
„ „ Town killed - -	—	3 11 „ 4 2	3 8 „ 3 11
LAMB:—			
English - -	6 8 to 7 8	5 7 „ 6 7	4 10 „ 5 6
New Zealand - -	3 5 „ 3 11	3 3 „ 3 7	3 2 „ 3 6
VEAL:—			
English - -	4 2 „ 5 1	4 2 „ 5 1	3 11 „ 4 9
Foreign - -	4 1 „ 4 11	3 11 „ 4 10	3 9 „ 4 7
PORK:—			
English, small - -	4 2 „ 4 7	4 1 „ 4 5	4 1 „ 4 6
„ medium and large - -	3 5 „ 4 1	} 3 2 „ 3 10	3 4 „ 3 11
Foreign - -	3 7 „ 4 2		

I.—PRICES OF LIVE AND DEAD MEAT—*continued.*

AVERAGE WHOLESALE PRICES of LIVE MEAT, per Stone of 8 lbs., sinking the Offal, at the METROPOLITAN CATTLE MARKET, during the Second and Third Quarters of 1894.

DESCRIPTION.	2ND QUARTER.			3RD QUARTER.		
	Inferior.	Second.	First.	Inferior.	Second.	First.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
BEEF -	2 5	3 11	4 6	2 5	4 0	4 7
MUTTON -	3 6	4 11	5 8	3 9	5 3	5 11
PORK -	—	—	—	—	—	—
VEAL -	2 5	4 7	5 8	2 7	4 0	5 2
LAMB -	6 0	6 7	7 2	5 8	6 1	6 9

AVERAGE WHOLESALE PRICES of BEEF and MUTTON, per Stone of 8 lbs., by the Carcase, at LIVERPOOL and GLASGOW, during the Second and Third Quarters of 1894.

DESCRIPTION.	LIVERPOOL.*				GLASGOW.†			
	2nd Quarter.		3rd Quarter.		2nd Quarter.		3rd Quarter.	
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
BEEF -	1 10	to 3 4	2 0	to 3 6	2 6	to 4 0	2 4	to 3 8
MUTTON -	3 4	„ 5 0	2 8	„ 4 8	4 0	„ 5 2	3 0	„ 4 8

* Compiled from information furnished by the Medical Officer of Health, Liverpool. The prices quoted are for Carcases of Animals *slaughtered at the Liverpool Abattoir*, and do not apply to Imported Meat.

† Compiled from information furnished by the Principal of the Veterinary College, Glasgow.

AVERAGE VALUES, per *Cwt.*, of various Kinds of DEAD MEAT Imported into the United Kingdom from FOREIGN COUNTRIES and BRITISH POSSESSIONS in the First, Second, and Third Quarters of 1894.

(Computed from the Trade and Navigation Accounts.)

PERIOD.	BEEF.		MUTTON.	PORK.		BACON.	HAMS.
	Fresh.	Salted.	Fresh.	Fresh.	Salted.		
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>		
1st Quarter -	42 5	31 4	39 11	49 1	35 3	45 4	47 4
2nd Quarter -	40 9	29 4	40 1	47 6	30 6	42 9	47 9
3rd Quarter -	39 1	26 5	36 9	47 11	26 6	44 8	52 11

II.—CORN PRICES :—ENGLAND AND WALES.

AVERAGE PRICES of **British Corn** per Quarter of 8 imperial bushels,* computed from the Weekly Averages of Corn Returns from the 196 Returning Markets, pursuant to the Corn Returns Act, 1882, together with the QUANTITIES returned as sold at such Markets, in the under-noted periods of the Years 1894, 1893, and 1892.

QUARTER ENDED.	PRICES.			QUANTITIES.		
	1894.	1893.	1892.	1894.	1893.	1892.
Wheat.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	25 1	25 7	33 8	613,313	708,986	834,939
Midsummer - -	24 4	26 2	30 11	429,451	674,704	785,022
Michaelmas - -	22 11	26 4	29 3	313,288	577,112	609,916
Christmas - -	—	27 2	27 5	—	659,258	823,002
Barley.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	28 1	25 2	28 5	671,620	1,092,457	1,191,530
Midsummer - -	25 2	24 0	25 6	40,863	104,155	116,801
Michaelmas - -	22 1	24 1	24 3	95,121	248,829	42,060
Christmas - -	—	29 1	26 5	—	1,920,615	2,143,243
Oats.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	18 1	17 7	20 3	193,922	201,572	180,600
Midsummer - -	18 7	19 5	21 1	61,862	75,457	55,605
Michaelmas - -	17 11	19 9	20 10	70,824	99,899	34,898
Christmas - -	—	18 1	17 6	—	198,594	221,063

* Section 8 of the Corn Returns Act, 1882, provides that where returns of purchases of British Corn are made to the local inspector of Corn Returns in any other measure than the imperial bushel or by weight or by a weighed measure, that officer shall convert such returns into the imperial bushel, and in the case of weight or weighed measure the conversion is to be made at the rate of 60 imperial pounds for every bushel of wheat, 50 imperial pounds for every bushel of barley, and 39 imperial pounds for every bushel of oats.

II.—CORN PRICES :—HARVEST YEAR.

AVERAGE PRICES of **British Corn** per Quarter of 8 imperial bushels, computed from the Weekly Averages of Corn Returns from the 196 Returning Markets, together with the QUANTITIES returned as sold at such Markets during each of the Harvest Years ending 31st August 1890 to 1894.

HARVEST YEARS.	PRICES.			QUANTITIES.		
	Wheat.	Barley.	Oats.	Wheat.	Barley.	Oats.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
1889-90 - - -	31 2	28 10	18 6	3,289,806	3,281,141	558,053
1890-91 - - -	35 5	28 0	19 1	3,496,788	3,659,382	602,887
1891-92 - - -	33 4	27 2	20 8	3,267,038	3,269,527	488,830
1892-93 - - -	26 8	24 10	18 9	2,676,227	3,385,094	547,412
1893-94 - - -	25 5	26 5	18 4	2,087,062	2,876,977	542,425

II.—CORN PRICES :—ENGLAND AND WALES—*continued.*

AVERAGE PRICES of **British Corn**, per Quarter of 8 imperial bushels, computed from the Returns received under the Corn Returns Act, 1882, in each of the under-mentioned Weeks in 1894, and in the Corresponding Weeks in 1893 and 1892.

Weeks ended (in 1894)	Wheat.			Barley.			Oats.		
	1894.	1893.	1892.	1894.	1893.	1892.	1894.	1893.	1892.
Jan. 6	s. d. 26 4	s. d. 25 10	s. d. 36 2	s. d. 28 10	s. d. 24 9	s. d. 29 2	s. d. 17 8	s. d. 16 8	s. d. 20 6
" 13	26 4	26 4	35 6	28 10	25 6	29 3	18 0	16 11	20 7
" 20	26 3	26 6	34 10	29 2	25 7	29 5	18 0	17 0	20 4
" 27	26 1	26 4	33 10	29 1	25 6	28 9	18 0	17 3	20 3
Feb. 3	25 7	26 3	33 1	28 11	25 4	28 7	18 1	17 5	20 2
" 10	25 3	25 11	32 3	28 8	25 0	28 5	17 10	17 11	19 8
" 17	24 10	25 7	32 1	28 3	24 11	28 0	18 0	17 10	20 0
" 24	24 5	25 5	32 8	28 0	25 1	27 10	18 4	18 0	20 1
Mar. 3	24 3	25 1	33 3	27 5	25 2	27 9	18 5	17 11	20 5
" 10	24 3	25 0	32 11	27 0	25 2	27 11	18 4	18 1	20 2
" 17	24 3	24 9	33 0	27 5	25 0	27 6	18 4	18 7	20 6
" 24	24 4	24 8	32 8	26 11	25 5	27 9	18 1	18 3	20 4
" 31	24 6	24 9	32 0	27 1	25 11	27 8	18 0	18 4	20 5
Apr. 7	24 6	24 9	31 4	26 7	25 6	26 11	18 3	17 11	20 2
" 14	24 7	24 10	30 7	27 10	24 8	26 10	18 2	18 7	20 7
" 21	24 8	25 5	30 8	28 6	24 5	25 11	18 4	18 8	20 7
" 28	24 10	25 10	31 3	26 3	24 0	26 7	18 3	19 3	21 0
May 5	24 10	25 10	31 6	26 1	23 11	25 10	18 7	19 5	20 7
" 12	24 9	26 4	31 7	24 11	22 7	25 2	18 9	19 4	21 4
" 19	24 5	27 0	31 6	25 0	23 2	24 10	18 9	19 8	21 3
" 26	24 4	27 6	31 2	24 0	25 0	25 7	18 10	19 6	21 8
June 2	23 11	27 5	30 8	23 11	24 2	24 6	18 9	20 4	21 4
" 9	23 9	27 4	30 5	26 11	22 10	25 2	18 6	20 0	21 8
" 16	23 10	26 11	29 10	24 11	23 5	23 8	18 9	21 1	22 2
" 23	23 11	26 9	29 6	22 5	23 3	23 4	18 10	21 3	21 10
" 30	24 1	26 9	29 3	20 5	20 9	23 4	19 2	21 5	21 8
July 7	24 6	26 8	29 2	23 7	20 6	24 4	19 6	21 0	21 7
" 14	24 5	26 8	29 1	21 0	22 3	22 4	19 7	22 3	21 5
" 21	24 6	26 5	29 3	19 6	20 3	22 10	19 7	21 9	21 0
" 28	24 8	26 5	29 5	22 5	23 1	21 1	20 5	21 7	21 6
Aug. 4	24 4	26 2	29 7	21 4	21 8	23 8	19 8	21 5	21 6
" 11	24 4	26 3	29 11	21 4	21 11	22 9	19 9	20 6	21 5
" 18	24 5	26 5	29 7	16 5	22 5	24 0	18 9	19 6	21 9
" 25	24 1	25 11	29 4	22 3	26 9	23 11	17 8	18 6	21 2
Sept. 1	22 7	25 5	29 1	24 1	26 9	24 2	17 1	18 7	20 3
" 8	21 7	25 7	29 5	24 11	27 2	27 8	16 6	17 4	20 2
" 15	20 5	26 0	29 1	23 9	27 8	27 11	15 9	17 6	19 4
" 22	19 8	26 9	28 4	23 5	27 10	28 3	15 2	17 9	18 10
" 29	18 9	27 6	27 10	23 5	28 4	27 11	14 3	17 11	18 0
Oct. 6	18 2	27 10	27 9	23 7	29 0	27 11	14 0	17 10	17 11
" 13	17 7	27 9	28 1	23 10	29 5	27 6	13 5	18 0	17 8
" 20	17 6	27 6	28 7	23 11	29 6	27 9	13 6	18 1	17 11
" 27	17 7	27 6	28 8	23 8	29 6	27 9	13 3	18 2	17 11
Nov. 3	18 0	27 4	28 9	23 8	29 5	27 7	13 6	18 2	17 9
" 10	18 4	27 4	28 3	23 0	29 3	27 4	13 7	18 1	18 0
" 17	19 1	27 4	27 11	22 7	29 2	26 7	13 10	18 2	18 0
" 24	19 11	27 1	27 5	22 4	28 9	26 0	14 3	18 3	17 7

III.—PRICES OF BUTTER, MARGARINE, AND CHEESE.

MEAN WHOLESALE PRICES of BUTTER, MARGARINE, and CHEESE,
in the month of November, and in the Second and Third
Quarters of 1894.

(Compiled from the *Grocer*.)

DESCRIPTION.	2nd Quarter of 1894.				3rd Quarter of 1894.				Month of No- vember 1894.			
	Per Cwt.				Per Cwt.				Per Cwt.			
BUTTER :	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Clonmel - -	—	—	—	—	—	—	—	—	—	—	—	—
Corks, 1sts -	88	0	to	—	82	7	to	—	88	3	to	—
„ 2nds -	83	0	„	—	78	6	„	—	76	3	„	—
„ 3rds -	78	0	„	—	72	8	„	—	64	9	„	—
„ 4ths -	67	0	„	—	65	1	„	—	54	3	„	—
Friesland -	82	0	„	86	0	84	11	„	89	8	97	6
Dutch Factories -	87	0	„	91	0	89	5	„	93	8	100	6
French Baskets -	98	0	„	105	0	94	6	„	102	11	98	0
„ Crocks and Firkins.	90	0	„	95	0	86	6	„	91	2	86	6
„ 2nds and 3rds	83	0	„	88	0	79	1	„	83	0	74	0
Jerseys - -	—	—	—	—	—	—	—	—	—	—	—	—
States and Canadian	53	0	„	73	0	45	0	„	65	0	—	—
Danish and Swedish	97	0	„	101	0	100	0	„	103	6	121	6
Finnish - -	82	0	„	92	0	79	3	„	91	0	80	0
Russian - -	77	0	„	88	0	74	0	„	86	9	70	8
Colonial - -	51	0	„	94	0	46	0	„	78	5	70	0
Fresh Rolls(Foreign) per doz.	10	4	„	13	4	9	11	„	13	2	9	7½
MARGARINE :												
Margarine - -	34	0	„	62	0	30	0	„	60	4	30	0
Mixtures - -	56	0	„	85	0	54	4	„	80	7	54	0
CHEESE :												
Cheddar - -	53	0	„	75	0	48	7	„	71	3	46	0
Somerset - -	55	0	„	73	0	52	2	„	69	3	50	0
Cheshire - -	60	0	„	92	0	60	0	„	83	1	35	0
Wiltshire - -	40	0	„	71	0	38	7	„	66	6	36	0
Double Gloucester -	48	0	„	62	0	40	9	„	59	10	42	0
Derby - -	51	0	„	61	0	47	7	„	53	1	37	0

IV.—PRICES OF FRUIT AND VEGETABLES.

MONTHLY MEAN PRICES (WHOLESALE) of FRUIT at the under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle*.)

DESCRIPTION.	September.		October.		November.	
COVENT GARDEN :	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Apples, cooking, per sieve.	4 0	to 6 0	4 0	to 6 0	4 0	to 6 0
Apples, dessert, per half sieve.	3 0	„ 5 0	2 9	„ 4 4 $\frac{1}{2}$	2 6	„ 3 6
Apples, per half sieve	1 9	„ 2 6	—	—	—	—
Cobs, per 100 lb. -	25 0	„ 30 0	25 0	„ 29 4 $\frac{1}{2}$	25 0	„ 27 6
Damsons, per half sieve.	1 6	„ 2 0	1 6	„ 2 0	—	—
Figs per dozen -	1 3 $\frac{1}{2}$	„ 2 4 $\frac{3}{4}$	1 6	„ 3 0	—	—
Grapes, 1st quality, Black English, per lb.	1 0	„ 1 9 $\frac{1}{2}$	1 0	„ 2 0	1 0	„ 2 0
Grapes, 2nd quality, Black English, per lb.	0 6	„ 1 0	0 6	„ 1 0	0 6	„ 1 0
Grapes, Guernsey, per lb.	0 5	„ 0 9	0 5	„ 0 9	0 5	„ 0 9
Peaches, large, per dozen.	4 0	„ 7 2 $\frac{1}{4}$	4 0	„ 8 0	—	—
Peaches, small, per dozen.	1 0	„ 2 0	1 0	„ 2 0	—	—
Pears, small, per sieve	1 10 $\frac{3}{4}$	„ 2 4 $\frac{3}{4}$	1 6	„ 2 0	—	—
Pears, dessert, per half sieve.	2 9 $\frac{1}{2}$	„ 4 0	2 0	„ 4 0	2 9	„ 5 6
Plums, per half sieve -	2 0	„ 3 9 $\frac{1}{2}$	2 0	„ 5 0	—	—
Tomatoes, per lb. -	0 3	„ 0 4	0 4 $\frac{1}{2}$	„ 0 6	0 6	„ 0 7
FARRINGTON :	—	—	—	—	—	—
Apples (dessert), King Pippins, per half sieve.	—	—	2 6	„ 3 0	—	—
Apples, Suffields, per bushel.	4 0	„ 5 0	—	—	—	—
Apples, Keswick Codlin, per bushel.	3 6	„ 4 0	—	—	—	—
Apples, per bushel -	3 0	„ 6 0	3 8	„ 5 0	5 0	„ 7 0
Cob nuts, per lb. -	0 3 $\frac{1}{4}$	„ —	—	—	—	—

IV.—PRICES OF FRUIT AND VEGETABLES—*continued*.

DESCRIPTION.	September.		October.		November.	
FARRINGTON— <i>cont.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Pears, per bushel -	1 6	to 4 0	3 0	to 6 0	--	--
„ per half sieve -	--	--	3 6	--	--	--
Pears, stewing, per bushel.	--	--	2 0	„ 3 0	--	--
Plums, Victorias, per half sieve.	2 0	„ 2 6	2 6	--	--	--
Plums, per half bushel	3 0	--	--	--	--	--
Tomatoes, per lb. -	0 3 $\frac{3}{4}$	--	0 5	--	0 4	to 0 5
Tomatoes, per dozen lbs.	3 0	„ 12 0	5 0	--	6 0	„ --
Walnuts, per bag of 165 lbs.	24 0	--	24 0	--	--	--
STRATFORD:						
Apples, English, per bushel.	2 6	„ 7 2	2 2	„ 4 6	2 0	„ 6 0
Damsons, per half sieve.	--	--	2 4 $\frac{1}{2}$	3 0	--	--
Damsons, per flat -	--	--	4 0	„ 4 6	--	--
Greengages, per half sieve.	1 10 $\frac{1}{2}$	2 9	--	--	--	--
Greengages, per flat -	3 9	„ 5 0	--	--	--	--
Pears, per barrel -	2 0	„ 4 0	--	--	--	--
„ per bushel -	2 0	„ 4 0	--	--	--	--
„ per half sieve -	1 0	„ 2 6	1 6	„ 1 9	--	--
„ per flat -	3 0	„ 5 0	--	--	--	--
Plums, per half sieve -	1 6	„ 2 7 $\frac{1}{2}$	--	--	--	--
„ per flat -	3 0	„ 4 6	--	--	--	--
Tomatoes, English, per dozen lb.	4 0	„ 4 6	4 0	„ 5 0	--	--
Tomatoes, Guernsey, per dozen lb.	3 0	„ 3 6	--	--	--	--
BOROUGH AND SPITAL-FIELDS:						
Apples, English, per bushel.	--	--	2 0	„ 6 0	2 6	„ 8 0
Pears, per half sieve -	0 9	„ 2 6	0 9	„ 3 6	1 9	„ 4 0
Plums, per half sieve -	0 9	„ 1 6	--	--	--	--

IV.—PRICES OF FRUIT and VEGETABLES—*continued.*

MONTHLY MEAN PRICES (WHOLESALE) OF VEGETABLES at the under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle.*)

DESCRIPTION.	OCTOBER.				NOVEMBER.			
	COVENT GARDEN.		FARRING-DON.		COVENT GARDEN.		FARRING-DON.	
	<i>s. d.</i>	<i>s. d.</i>	<i>d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Beetroots, per bushel - -	—	—	1 3		—	—	—	—
„ „ dozen - -	—	—	0 6		—	—	—	—
Cabbages, per tally - -	—	—	2 0 to 3 0		—	—	—	—
„ Pickling, per dozen -	—	—	1 6 „ 2 0		—	—	—	—
Carrots, English, per dozen bunches.	—	—	—	—	—	—	—	—
Cauliflowers, per dozen - -	1 0 to 1 6		0 5 „ 1 0		1 0 to 1 6		1 0 to	
Celery, per dozen rolls - -	—	—	8 0 „ 9 6		—	—	8 0 „	
Cucumbers, per dozen - -	1 10½ „ 2 10½		1 4 „ 1 9		3 9 „ 4 9		—	—
Greens, Bunch, per tally - -	—	—	1 0 „ 1 4½		—	—	—	—
Horseradish, per bundle - -	—	—	1 0 „ 1 2		—	—	1 3 „	
Lettuce, per score - -	—	—	0 5 „ 0 6		—	—	—	—
Marrows, per dozen - -	1 3 „ 2 0		1 0		—	—	—	—
Mushrooms, per lb. - -	1 0 „ 1 3		—	—	0 9 „ 1 0		—	—
Onions, per bushel - -	2 0 „ 2 6		—	—	1 7½ „ 2 1½		—	—
„ „ cwt. - -	—	—	3 6		—	—	3 6 „ 4 0	
Parsnips, per ton - -	60 0		50 0 „ 60 0		—	—	47 6 „ 52 6	
Potatoes, Bedford's Colossal, per ton.	—	—	80 0 „ 90 0		—	—	—	—
„ Blacklands, per ton -	48 9 „ 60 0		45 0 „ 55 0		—	—	—	—
„ Bruce, „ „ -	70 0 „ 80 0		60 0 „ 68 4		80 0 „ 90 0		62 6 „ 75 0	
„ Early Rose, „ „ -	—	—	50 0 „ 55 0		—	—	—	—
„ Giants, „ „ -	63 4 „ 73 4		—	—	—	—	60 0 „ 70 0	
„ Hebrons, „ „ -	76 8 „ 100 0		65 0 „ 81 8		95 0 „ 105 0		—	—
„ Imperators, „ „ -	—	—	55 0 „ 65 0		80 0 „ 90 0		65 0 „ 70 0	
„ Kidneys, „ „ -	—	—	60 0 „ 70 0		—	—	—	—
„ Magnums, „ „ -	70 0 „ 80 0		57 6 „ 68 9		70 0 „ 80 0		60 0 „ 80 0	
„ Main Crops, „ „ -	80 0 „ 96 8		70 0 „ 80 0		95 0 „ 105 0		80 0 „ 90 0	
„ Regents, „ „ -	—	—	65 0 „ 75 0		—	—	—	—
„ Rounds, „ „ -	—	—	45 0		—	—	—	—
„ „ Essex, per ton -	—	—	55 0 „ 70 0		—	—	—	—
„ Snowdrops, „ „ -	80 0 „ 96 8		80 0 „ 95 0		95 0 „ 105 0		—	—
„ Sutton's Abundance, per ton.	—	—	75 0 „ 90 0		—	—	75 0 „ 90 0	
„ Triumphs, per ton -	—	—	90 0 „ 100 0		—	—	—	—
Savoys, per tally - -	—	—	2 6 „ 3 0		—	—	—	—
Spinach, per half peck - -	—	—	1 0 „ 1 3		—	—	—	—
Sprouts, per bushel - -	—	—	1 9		—	—	—	—
„ „ per half sieve - -	—	—	1 0		—	—	0 9 „ 1 1½	
Turnips, per dozen bunches -	—	—	1 4½ „ 1 9		—	—	—	—

IV.—PRICES OF FRUIT and VEGETABLES—*continued.*

MONTHLY MEAN PRICES (WHOLESALE) OF VEGETABLES at the under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle.*)

DESCRIPTION.	OCTOBER.				NOVEMBER.			
	BOROUGH.		STRATFORD.		BOROUGH.		STRATFORD.	
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Cabbages, per tally -	1 6	to 3 0	1 6	to 2 0	1 6	to 3 0	1 6	to 2 6
Carrots, Household, per dozen bunches.	1 0	„ 2 0	—	—	1 6	„ 1 9	—	—
Cauliflowers, per dozen	—	—	0 7½	„ 0 11	—	—	0 6	„ 1 0
„ per tally	—	—	3 0	„ 4 0	4 0	„ 6 0	2 0	„ 4 3
Collards, per tally	—	—	2 0	„ 2 6	—	—	—	—
Cucumbers, frame, per dozen	—	—	1 0	„ 1 6	—	—	—	—
Greens, per tally	—	—	2 6	„ 4 0	—	—	3 0	„ 5 6
Horseradish, per bundle	1 0	„ 1 6	—	—	1 1	„ 1 4½	1 0	„ 1 3
Mangels, per ton	—	—	10 8	„ 16 0	—	—	12 0	„ 17 0
Onions, per bag	2 0	„ 2 10	3 6	„ 4 0	1 10½	„ 2 6	2 0	„ 2 6
„ English, per cwt.	3 6	„ 4 6	3 0	„ 3 6	2 9	„ 3 7½	3 0	„ 3 9
Parsley, per dozen bunches	0 8½	„ 1 4	—	—	0 10½	„ 1 1	—	—
Parsnips, per score	—	—	0 8	„ 0 10½	—	—	0 6	„ 0 10
Savoy, per tally	—	—	2 0	„ 3 6	2 6	„ 3 6	1 6	„ 3 0
Sprouts, per half sieve	—	—	1 6	„ 1 9	—	—	0 9	„ 1 3
Swedes, per ton	—	—	14 8	„ 18 4	—	—	15 0	„ 20 0
Turnips, per dozen bunches	1 6	„ 2 0	1 7	„ 2 2	1 6	„ 2 0	1 6	„ 2 4½
Watercress, per dozen	—	—	0 6	—	—	—	—	—

V.—PRODUCE OF HOPS.

The Board of Agriculture issued in October last the following Preliminary Statement showing the estimated total production of Hops in the years 1894 and 1893, with the acreage and estimated average yield per statute acre in each county of England in which hops were grown. As this Preliminary Statement is issued at the earliest possible moment after receipt of the particulars, it is necessarily subject to correction in the Annual Produce Statistics.

COUNTIES.	Estimated Total Produce.		Acreage.		Estimated Average Yield per Acre.	
	1894.	1893.	1894.	1893.	1894.	1893.
	<i>Cwts.</i>	<i>Cwts.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Cwts.</i>	<i>Cwts.</i>
BERKS. -	93	82	11	11	8'45	7'45
GLOUCESTER -	214	198	39	33	5'49	6'00
HANTS -	24,581	21,077	2,911	2,795	8'44	7'54
HEREFORD -	37,749	65,939	7,525	7,079	5'02	9'31
KENT -	424,779	230,891	35,520	34,815	11'96	6'63
SALOP -	545	1 318	140	123	3'89	10'72
SUFFOLK -	112	—	17	21	6'59	—
SURREY -	17,595	12,293	1,935	1,845	9'09	6'66
SUSSEX -	106,205	50,445	7,589	7,326	13'99	6'89
WORCESTER -	24,973	32,686	3,848	3,516	6'49	9'30
Total -	636,846	414,929	59,535	57,564	10'70	7'21

VI.—DISEASES OF ANIMALS IN GREAT BRITAIN.

NUMBER OF CATTLE returned as SLAUGHTERED, by order of the Board of Agriculture, on account of **Pleuro-Pneumonia**, and Number of SWINE returned as having DIED from **Swine-Fever**, or as having been SLAUGHTERED, by order of the Board of Agriculture, in Great Britain in each of the under-mentioned periods.

QUARTER ENDED	Pleuro-Pneumonia.			Swine-Fever.		
	CATTLE Slaughtered as Diseased, including those which were found after Slaughter to be diseased.	CATTLE Slaughtered as having been in Contact with Cattle affected or as having been otherwise exposed to infection.	CATTLE Slaughtered as Suspected, but found free from Pleuro-Pneumonia.	SWINE that Died of Swine-Fever.	SWINE Slaughtered as Diseased, or as having been exposed to infection.	SWINE Slaughtered as Suspected, but found free from Swine-Fever.
	No.	No.	No.	No.	No.	No.
September 1894	7	88	7	1,971	12,311	435
June 1894 -	8	303	16	2,186	22,306	374
March 1894 -	—	—	13	1,862	14,057	221
December 1893	5	422	19	*1,652	*7,536	*93
September 1893	12	389	26	1,384	2,033	—
June 1893 -	13	346	22	1,872	3,395	—
March 1893 -	—	—	19	1,259	2,438	—

* The powers vested in the Board of Agriculture under the Contagious Diseases (Animals) Act, 1893, with respect to Swine-Fever, took effect on the 1st November 1893.

NUMBER of PLACES upon which OUTBREAKS were reported as having taken place, and Number of ANIMALS returned as having been ATTACKED by ANTHRAX, GLANDERS, and RABIES in Great Britain in each of the under-mentioned periods.

QUARTER ENDED	Anthrax.		Glanders (including FARCY).		Rabies.
	OUT-BREAKS.	ANIMALS ATTACKED.	OUT-BREAKS.	ANIMALS ATTACKED.	DISEASED ANIMALS KILLED or DIED.
	No.	No.	No.	No.	No.
September 1894	93	222	230	370	46
June 1894 -	114	259	231	351	61
March 1894 -	184	361	290	378	37
December 1893	179	414	312	441	45
September 1893	153	332	352	536	6
June 1893 -	113	267	336	498	23
March 1893 -	118	287	381	658	20

VII.—DISEASES OF ANIMALS IN IRELAND.

NUMBER of CATTLE returned as SLAUGHTERED, by order of the Lord Lieutenant and Privy Council in Ireland, on account of **Pleuro-Pneumonia**, and Number of SWINE returned as having Died from **Swine-Fever**, or as having been SLAUGHTERED, by order of the Lord Lieutenant and Privy Council in Ireland, in each of the under-mentioned periods.

QUARTER ENDED	Pleuro-Pneumonia.			Swine-Fever.		
	CATTLE Slaughtered as Diseased, including those which were found after Slaughter to be diseased.	CATTLE Slaughtered as having been in Contact with Cattle affected or as having been otherwise exposed to infection.	CATTLE Slaughtered as Suspected, but found free from Pleuro-Pneumonia.	SWINE that Died of Swine-Fever.	SWINE Slaughtered as Diseased, or as having been exposed to infection.	SWINE Slaughtered as Suspected, but found free from Swine-Fever.
	No.	No.	No.	No.	No.	No.
September 1894	—	—	1	902	9,446	651
June 1894 -	—	—	5	932	12,060	71
March 1894 -	—	—	22	540	7,749	159
December 1893	—	—	25	} *409	*1,259	*34
September 1893	—	35	48			
June 1893 -	—	—	35			
March 1893 -	—	—	59			

* The powers vested in the Lord Lieutenant and Privy Council in Ireland under the Contagious Diseases (Animals) Act, 1893, with respect to Swine-Fever, took effect on the 1st November 1893.

NUMBER of Places upon which OUTBREAKS were reported as having taken place, and Number of ANIMALS returned as having been ATTACKED by ANTHRAX, GLANDERS, and RABIES in each of the under-mentioned periods.

QUARTER ENDED	Anthrax.		Glanders (including Farcy).		Rabies.
	OUTBREAKS.	ANIMALS ATTACKED.	OUTBREAKS.	ANIMALS ATTACKED.	DISEASED ANIMALS KILLED OR DIED.
	No.	No.	No.	No.	No.
September 1894	1	1	6	19	242
June 1894 -	—	—	4	9	213
March 1894 -	3	3	1	1	89
December 1893	2	3	2	6	91
September 1893	10	31	—	—	137
June 1893 -	5	6	2	3	122
March 1893 -	5	5	2	2	75

XIX.—IMPORTS OF HAY AND STRAW.

The imports of Hay and Straw, as recorded by the Customs in the first nine months of the years 1893 and 1894, are shown below, distinguishing the countries from which the supplies came.

Countries whence exported.	Hay.		Straw.	
	1893.	1894.	1893.	1894.
	Tons.	Tons.	Tons.	Tons.
Algeria - - -	731	2,615	414	—
Argentine Republic - - -	20,411	735	—	27
Belgium - - -	1,549	3,208	178	1,618
Bengal - - -	—	—	1	—
Bombay - - -	69	—	—	—
Canada - - -	34,225	21,866	30	—
Canary Islands - - -	1	—	—	—
Channel Islands - - -	—	—	—	2
Chile - - -	1,088	4,070	3	—
Cape of Good Hope - - -	—	1	—	—
Denmark - - -	3,147	4,450	3,993	2,391
Egypt - - -	—	—	4	8
France - - -	926	3,909	2,662	5,685
Germany - - -	1,474	1,843	5,932	5,458
Greece - - -	—	25	—	—
Holland - - -	18,051	11,292	10,267	21,607
Italy - - -	—	125	—	—
Malta - - -	9	—	—	—
Newfoundland - - -	107	23	—	—
New Zealand - - -	—	22	—	—
Norway - - -	1,225	2,861	2	339
Portugal - - -	44	—	5	—
Russia, North - - -	7,074	27,791	4	913
„ South - - -	707	997	—	511
South Australia - - -	3	—	—	—
Spain - - -	104	364	2	—
Sweden - - -	177	—	—	7
Tripoli - - -	—	3	—	—
Turkey, European - - -	58	476	—	—
„ Asiatic - - -	4	542	1	—
United States - - -	64,182	141,294	401	466
Victoria - - -	—	3	—	—
Total - - -	155,366	228,515	23,899	39,032

The disturbing effect of the drought of 1893 upon the imports of Hay into the United Kingdom are still shown in the preceding statement. The large augmentations in the quantities of hay imported monthly in the latter part of 1893 continued during the first five months of 1894. It is, however, now to be noted that the trade has in recent months returned again nearly to its normal dimensions. The last monthly importation of hay on the scale which obtained during the period referred to was in May, 1894, when nearly 33,000 tons were received in this country. In June last the imports dropped to 16,448 tons, in July they were 14,949 tons, and in August 18,800 tons. Subsequently the diminution was still more marked, only 9,951 tons being received in September, 1894, against 35,586 tons in Sep-

tember, 1893, and in October, 1894, the importation sank to 8,981 tons, as compared with 29,242 tons in the same month of last year.

The special sources whence supplies were drawn in 1893 have also nearly ceased to furnish consignments, as the following list of the principal countries exporting hay to Great Britain in October 1893 and 1894 respectively will show.

Countries.	October, 1893.	Countries.	October, 1894.
	Tons.		Tons.
United States -	8,961	United States -	2,764
Russia -	5,439	Canada -	2,663
Canada -	5,053	France -	1,304
Holland -	3,680	Holland -	1,193
Argentina -	3,293	Denmark -	355
Chili -	1,058	Belgium -	303
Belgium -	662	Tunis -	275
All other Countries -	1,096	All other Countries -	134
Total -	29,242	Total -	8,981

Russia and Argentina, which between them furnished 8,732 tons in October, 1893, have sent the one 34 tons, and the other 27 tons only in October, 1894.

POST OFFICE SAVINGS BANKS, WITH GOVERNMENT SECURITY.

ADVANTAGES OFFERED FOR OLD AGE PENSIONS.

Provision for old age can be made by buying Savings Bank Deferred Annuities from 1*l*. to 100*l*. to begin at any age selected.

RETURN OF PURCHASE MONEY. The Premiums for Deferred Annuities can be returned on application, or on Death before the Annuity begins, if the Contract is taken out on these conditions.

IMMEDIATE PENSIONS. Annuities to begin at once, of any amount from 1*l*. to 100*l*. a year, can be bought through the Post Office Savings Bank. The Purchase Money is payable in a lump sum which is not returnable, and the Pensions are payable half-yearly.

Savings Banks Annuities are payable by half-yearly instalments on the 5th January and the 5th July, or the 5th April and 10th October, according to the date of purchase.

PROCEDURE. A simple form of Proposal, and a form for statement of age, can be obtained at any Savings Bank Office. When filled up the forms will be forwarded by the local Postmaster to the Chief Office, London, and a Contract will be issued when the first premium has been paid. Annuity Premiums are payable in the same way as Insurance Premiums, namely, by transfers from Savings Bank accounts.

The following Table shows the yearly sums for which an Immediate Life Annuity, and a Deferred Life Annuity, respectively of £1 will be granted.

POST OFFICE SAVINGS BANKS.

OLD AGE PENSIONS.—DEFERRED LIFE ANNUITIES.

The Annuity Tables below give the cost of an Annuity of £1, and an Annuity of a larger amount costs a larger sum in exact proportion. For instance, a Pension of £10 a year would cost ten times the amount given below. In this class of Annuities the Purchase Money will be returned on application, or on the Death of the Nominee, if an instalment of the Annuity shall not have become due. These Pensions can be Deferred any number of years from 10 to 50, and any cost not given below will be furnished on application to the Controller, Post Office Savings Bank, London.

Purchase Money Returnable Scale.

Age at time of Purchase.	Cost of an Annuity of £1 payable after the expiration of 10 YEARS.				Cost of an Annuity of £1 payable after the expiration of 20 YEARS.			
	Males.		Females.		Males.		Females.	
	In 11 Yearly Sums of	In one Sum at time of Purchase.	In 11 Yearly Sums of	In one Sum at time of Purchase.	In 21 Yearly Sums of	In one Sum at time of Purchase.	In 21 Yearly Sums of	In one Sum at time of Purchase.
21 and under 22	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
22 " 23	1 12 5	15 15 9	1 15 10	17 9 0	0 13 0	10 15 1	0 14 6	11 19 3
23 " 24	1 12 0	15 11 10	1 15 5	17 5 1	0 12 10	10 11 8	0 14 3	11 15 6
24 " 25	1 11 7	15 7 11	1 15 0	17 1 1	0 12 7	10 8 4	0 14 0	11 11 9
25 " 26	1 11 3	15 4 0	1 14 7	16 17 0	0 12 5	10 4 10	0 13 9	11 7 10
26 " 27	1 10 10	15 0 0	1 14 2	16 12 11	0 12 2	10 1 4	0 13 6	11 3 10
27 " 28	1 10 5	14 16 0	1 13 9	16 8 8	0 12 0	9 17 10	0 13 3	10 19 9
28 " 29	1 10 0	14 11 11	1 13 4	16 4 4	0 11 9	9 14 3	0 13 0	10 15 6
29 " 30	1 9 7	14 7 10	1 12 10	16 0 0	0 11 6	9 10 7	0 12 9	10 11 3
30 " 31	1 9 2	14 3 9	1 12 5	15 15 6	0 11 4	9 6 10	0 12 6	10 6 10
31 " 32	1 8 8	13 19 6	1 11 11	15 10 11	0 11 1	9 3 1	0 12 3	10 2 6
32 " 33	1 8 3	13 15 3	1 11 5	15 6 3	0 10 10	8 19 2	0 12 0	9 18 1
33 " 34	1 7 10	13 11 0	1 10 11	15 1 6	0 10 7	8 15 2	0 11 9	9 13 8
34 " 35	1 7 5	13 6 8	1 10 5	14 16 7	0 10 4	8 11 2	0 11 5	9 9 2
35 " 36	1 6 11	13 2 3	1 9 11	14 11 7	0 10 1	8 7 0	0 11 2	9 4 6
36 " 37	1 6 6	12 17 9	1 9 5	14 6 6	0 9 10	8 2 10	0 10 11	8 19 11
37 " 38	1 6 0	12 13 3	1 8 11	14 1 3	0 9 7	7 18 6	0 10 7	8 15 2
38 " 39	1 5 6	12 8 7	1 8 4	13 15 10	0 9 4	7 14 1	0 10 4	8 10 4
39 " 40	1 5 1	13 3 11	1 7 9	13 10 4	0 9 1	7 9 6	0 10 0	8 5 5
40 " 41	1 4 7	11 19 2	1 7 2	13 4 10	0 8 9	7 4 10	0 9 9	8 0 7
41 " 42	1 4 1	11 14 4	1 6 7	12 19 2	0 8 6	7 0 2	0 9 5	7 15 8
42 " 43	1 3 7	11 9 4	1 6 0	12 13 7	0 8 3	6 15 7	0 9 2	7 10 9
43 " 44	1 3 0	11 4 3	1 5 6	12 7 11	0 7 11	6 11 2	0 8 10	7 5 10
44 " 45	1 2 6	10 19 1	1 4 10	12 2 1	0 7 8	6 6 9	0 8 6	7 1 0
45 " 46	1 2 0	10 13 9	1 4 3	11 16 3	0 7 5	6 2 4	0 8 3	6 16 0
46 " 47	1 1 5	10 8 4	1 3 8	11 10 3	0 7 2	5 18 0	0 7 11	6 11 0

Purchase Money Not Returnable Scale.

21 and under 22	1 10 3	14 2 4	1 14 0	16 1 5	0 11 0	8 5 11	0 12 11	9 19 2
22 " 23	1 9 10	13 18 1	1 13 7	15 17 3	0 10 10	8 2 2	0 12 8	9 15 4
23 " 24	1 9 5	13 13 8	1 13 2	15 13 1	0 10 7	7 18 5	0 12 5	9 11 5
24 " 25	1 8 11	13 9 4	1 12 9	15 8 10	0 10 4	7 14 7	0 12 2	9 7 6
25 " 26	1 8 6	13 4 10	1 12 4	15 4 6	0 10 2	7 10 9	0 11 11	9 3 6
26 " 27	1 8 1	13 0 5	1 11 10	15 0 1	0 9 11	7 6 11	0 11 8	8 19 5
27 " 28	1 7 8	12 15 11	1 11 5	14 15 7	0 9 8	7 3 1	0 11 5	8 15 3
28 " 29	1 7 2	12 11 5	1 10 11	14 11 1	0 9 5	6 19 2	0 11 2	8 11 0
29 " 30	1 6 9	12 6 10	1 10 6	14 6 5	0 9 3	6 15 4	0 10 11	8 6 9
30 " 31	1 6 3	12 2 3	1 10 0	14 1 9	0 9 0	6 11 4	0 10 8	8 2 5
31 " 32	1 5 10	11 17 8	1 9 6	13 16 11	0 8 9	6 7 5	0 10 5	7 17 11
32 " 33	1 5 4	11 13 0	1 9 0	13 12 1	0 8 6	6 3 6	0 10 1	7 13 5
33 " 34	1 4 11	11 8 3	1 8 6	13 7 2	0 8 3	5 19 6	0 9 10	7 8 10
34 " 35	1 4 5	11 3 6	1 8 0	13 2 1	0 8 0	5 15 6	0 9 6	7 4 2
35 " 36	1 3 11	10 18 9	1 7 6	12 16 11	0 7 9	5 11 5	0 9 3	6 19 5
36 " 37	1 3 5	10 13 11	1 6 11	12 11 8	0 7 6	5 7 5	0 8 11	6 14 8
37 " 38	1 3 0	10 9 1	1 6 5	12 6 4	0 7 3	5 3 4	0 8 8	6 9 10
38 " 39	1 2 6	10 4 2	1 5 10	12 0 10	0 7 0	4 19 2	0 8 4	6 4 11
39 " 40	1 2 0	9 19 2	1 5 3	11 15 3	0 6 9	4 15 1	0 8 0	6 0 0
40 " 41	1 1 6	9 14 2	1 4 8	11 9 7	0 6 6	4 10 10	0 7 9	5 14 11
41 " 42	1 0 11	9 9 1	1 4 1	11 3 9	0 6 2	4 6 8	0 7 5	5 9 10
42 " 43	1 0 5	9 4 0	1 3 5	10 17 9	0 5 11	4 2 5	0 7 1	5 4 9
43 " 44	0 19 11	8 18 10	1 2 10	10 11 9	0 5 8	3 18 1	0 6 9	4 19 7
44 " 45	0 19 4	8 13 7	1 2 2	10 5 6	0 5 4	3 13 9	0 6 5	4 14 4
45 " 46	0 18 10	8 8 3	1 1 6	9 19 3	0 5 1	3 9 5	0 6 1	4 9 1

LIST OF LEAFLETS ISSUED BY THE BOARD OF AGRICULTURE.

Number.	Title.
A 3.—1893 I.	Cultivation of Osiers.
A 4.— „ I.	Insects on Fruit Trees.
A 5.— „ I.	The Mangel Wurzel Fly.
A 7.— „ I.	Autumn Catch Crops and Fodder Supply.
A 8.— „ I.	Farmers and Assessments to Local Rates.
A 9.— „ I.	Ensilage.
A 10.— „ I.	The Ribbon Footed Corn-Fly.
A 11.— „ I.	Anthrax.
A 12.— „ I.	The Gooseberry Saw-Fly.
A 13.— „ I.	Acorn Poisoning.
A 14.— „ I.	The Raspberry Moth.
A 15.— „ I.	The Apple Blossom Weevil.
A 16.— „ I.	The Apple Sucker.
A 17.— „ I.	Preservation of Commons.
A 18.— „ I.	Fertilisers and Feeding Stuffs Act, 1893.
A 1.—1894 I.	Mites on Currant and Nut Trees.
A 2.— „ I.	Vine and Raspberry Weevils.
A 3.— „ I.	The Diamond Back Moth.
A 4.— „ I.	The Daddy Longlegs.
A 5.— „ I.	Potato Disease.
A 6.— „ I.	The Warble Fly.
A 7.— „ I.	Farmers and the Income Tax.
A 8.— „ I.	Moths on Fruit Trees.
A 9.— „ I.	Remission of Tithe Rentcharge.

Copies of the above leaflets are to be obtained free of charge and post free on application to the Secretary, Board of Agriculture, 4, Whitehall Place, London, S. W. Letters of application so addressed need not be stamped.



Special
attention
given to
Colonial
and
Export
Orders.



Applications
invited
for
Home
and
Colonial
Agencies.

GUANO. Raw, Equalised, Dissolved.
SUPERPHOSPHATES.
26% to 40% SOLUBLE.
BONE MANURES.
CEREAL, SUGAR, COFFEE
AND OTHER
SPECIAL MANURES.

DANIEL DE PASS & CO.,
1, FENCHURCH BUILDINGS, LONDON.

SUTTON'S

SEEDS

FOR THE

FARM

MANGEL.

"We had the best piece of Mangel in our neighbourhood from the seed I procured from you. The drought was very severe."—Mr. C. ALLAM, Bailiff to Sir T. FOWELL BUXTON, Bart.

SWEDE.

"Having grown Champion Swede over 30 years, I consider it the best and surest cropper in existence."—Mr. R. B. SMITH, Steward to the Right Hon. Lord PENRHYN.



SUTTON'S

SEEDS

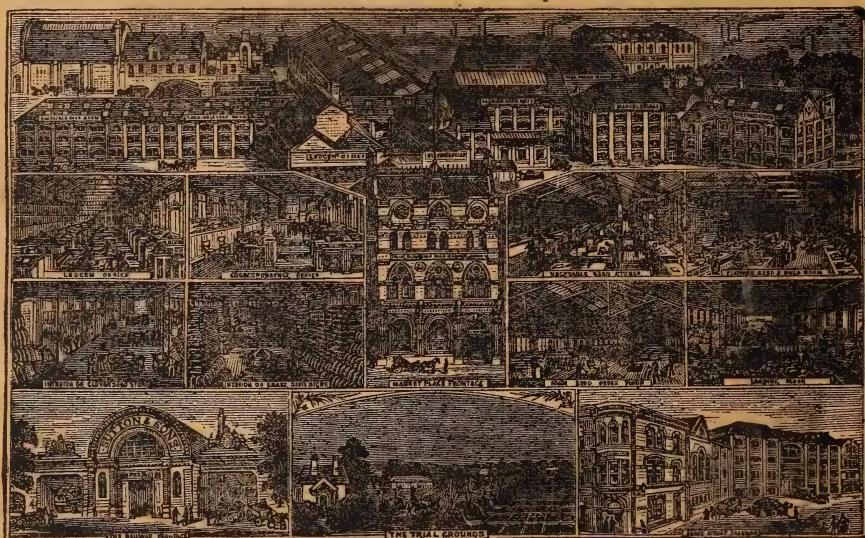
FOR THE

GARDEN

GRASS.

"In 1880-3-4 and 1887, I had the pleasure to order for Lord Hotham large quantities of Permanent Grass seeds from your firm, all of which have done well, including the park of nearly 400 acres, which is yearly improving in quality."—H. L. CHOWEN, Esq., F.S.I., Dalton Hulme.

"The late Mr. Cheney began to lay down land to Permanent Pasture at the early period of the depression, and owing to the very excellent seeds you supplied, to the extent of nearly 2,000 acres, the whole estate is now Permanent Pasture of the very best description."—CHARLES BLAND, Esq., Gaddesby.



A MINIATURE VIEW OF THE ROYAL SEED ESTABLISHMENT, READING.

PERMANENT AND TEMPORARY PASTURES.

By MARTIN J. SUTTON.

THE BEST WORK ON GRASS LANDS.

Illustrated with 23 superior Wood Engravings of Grasses, Clovers, &c. The book also contains forty-six Analyses of Grasses, Clovers, &c., prepared expressly for this work by Dr. J. Augustus Voelcker. Popular Edition, 5s., post free.

From the *Times*:—"All interested in the land will be pleased to have such a practical and scientific guide to grass land culture."

SUTTON'S FARMERS' YEAR BOOK AND GRAZIERS' MANUAL.

Contains full instructions on the laying down of land to Permanent and Temporary Pasture, particulars of the best mixtures for various soils, a price list of all the best Natural Grasses and Clovers, and much valuable information on Mangels, Swedes, Turnips, Cabbages, &c., &c. Published annually in February.

GRATIS TO CUSTOMERS.

SUTTON'S SEEDS

GENUINE ONLY FROM SUTTON & SONS, READING.

NO AGENTS

NO AGENTS

[PRICE SIXPENCE.]

[All rights reserved.]

The Journal

OF THE

Board of Agriculture.

March 1895.

	Page
THE BRITISH HARVEST OF 1894	273
THE FERTILISERS AND FEEDING STUFFS ACT, 1893	276
THE SHORT-EARED OWL	278
DUCK FATTENING INDUSTRY AT AYLESBURY	281
AGRICULTURE IN VICTORIA	284
MARKET GARDENING	287
EXPORTS OF BRITISH CATTLE IN 1894	292
REPORTS ON FOREIGN CROPS	295
INJURIOUS INSECTS AND FUNGI	300
GENERAL AGRICULTURAL NOTES	317
EXTRACTS FROM DIPLOMATIC AND CONSULAR REPORTS	336
PRICES OF LIVE STOCK	350
PARLIAMENTARY PUBLICATIONS	359
IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCE	368
STATISTICAL TABLES	380

(For detailed Table of Contents see page xv of Advertisements.)



LONDON:

PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY EYRE AND SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from
EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or
JOHN MENZIES & Co., 12, HANOVER STREET, EDINBURGH, and
90, WEST NILE STREET, GLASGOW; or
HODGES, FIGGIS, & Co., LIMITED, 104, GRAFTON STREET, DUBLIN.

1895.

Carters Seeds.

**GRASS SEEDS for
PERMANENT PASTURES**

from 20/- to 34/- per acre, Carriage free.

One year's mowing or grazing - - 9/- to 14/- per acre

Two years' mowing or grazing - - 12/6 to 16/6 per acre

Three or four years' mowing or grazing - 15/6 to 19/- per acre

CARTERS' SAINFOIN MIXTURE 32/- per acre

CARTERS' LUCERNE MIXTURE 28/- per acre

MANGEL SEED - from 6d. to 10d. per lb.

SWEDE SEED - - from 6d. to 1/- per lb.

TURNIP SEED - - from 6d. to 9d. per lb.

SEED CORN EQUALLY MODERATE.

Our Detailed Catalogue giving prescriptions of
Grass Seeds for all purposes will be sent free to
intending Customers.

SPECIAL PRICES FOR QUANTITIES. CARRIAGE FREE.

Carters **THE QUEEN'S SEEDSMEN,**
High Holborn London

The Journal

OF THE

Board of Agriculture.

Vol. I.]

March 1895.

[No. 13.]

I.—THE BRITISH HARVEST OF 1894.

The Board of Agriculture issued on the 15th December last a preliminary statement of the estimated produce and yield per acre of the wheat, barley, and oat crops of Great Britain in 1894. The estimates may now be added for the potato and hay crops, pending the publication of the complete returns of produce for the year. Compared with the immediately preceding year, both as regards the bulk and the yield per acre, and with the mean of the 10 official estimates now available as to the yield of each harvest from 1885 to 1894 inclusive, the results of the wheat crop may be shown as under:—

Wheat.	Estimated Total Produce.		Estimated Yield.		Average Yield, 1885-94.
	1894.	1893.	1894.	1893.	
	Bushels.	Bushels.	Bushels per Acre.	Bushels per Acre.	Bushels per Acre.
England - - - -	56,088,000	46,429,000	30·7	25·8	29·3
Wales - - - -	1,420,000	1,205,000	25·1	22·1	23·3
Scotland - - - -	1,665,000	1,613,000	37·1	36·6	35·3
GREAT BRITAIN -	59,173,000	49,247,000	30·7	25·9	29·3

Arranging similarly the estimates for barley, the comparison of the official estimates of yield for 1894 with those of 1893, and with the mean of the whole period 1885-94, shows much the same characteristic variation.

Barley.	Estimated Total Produce.		Estimated Yield.		Average Yield, 1885-94.
	1894.	1893.	1894.	1893.	
	Bushels.	Bushels.	Bushels per Acre.	Bushels per Acre.	Bushels per Acre.
England - - - -	61,194,000	49,633,000	34·6	28·0	33·1
Wales - - - -	3,348,000	2,803,000	30·0	25·1	28·0
Scotland - - - -	7,753,000	7,700,000	35·5	36·4	35·3
GREAT BRITAIN -	72,295,000	59,536,000	34·5	28·7	33·0

In the case of oats, the continued extension of the acreage adds proportionally more to the aggregate production of the year. The comparative yields for each division of Great Britain are as shown below :—

Oats.	Estimated Total Produce.		Estimated Yield.		Average Yield, 1885-94.
	1894.	1893.	1894.	1893.	
	Bushels.	Bushels.	Bushels per Acre.	Bushels per Acre.	Bushels per Acre.
England - - - -	88,289,000	67,164,000	44·6	35·1	40·6
Wales - - - - -	9,013,000	7,452,000	35·9	30·9	32·6
Scotland - - - -	38,161,000	38,271,000	37·3	37·6	35·6
GREAT BRITAIN -	135,463,000	112,887,000	41·6	35·6	38·2

Turning to the crops for which the estimates have not yet been published, it will be found that in the case of potatoes the production of the year 1894 is very materially less than in 1893, and is the smallest crop of any year of the series for which returns have been collected. This is partly due to the diminished acreage already shown in the published agricultural returns, but the following table shows that the yield has also fallen short not only of that of 1893, but also of the mean of the ten years :—

Potatoes.	Estimated Total Produce.		Estimated Yield per Acre.		Average Yield per Acre, 1885-94.
	1894.	1893.	1894.	1893.	
	Tons.	Tons.	Tons.	Tons.	Tons.
England - - - - -	1,975,000	2,362,000	5·8	6·6	5·9
Wales - - - - -	186,000	232,000	5·5	6·6	5·6
Scotland - - - - -	623,000	882,000	4·8	6·4	5·6
GREAT BRITAIN -	2,789,000	3,476,000	5·5	6·6	5·8

Few features of the season of 1893 were more remarkable than the greatly reduced total production, and the diminished yield per acre, of the hay crop obtained both from clover and rotation grasses and from permanent pasture. The expectation that the opposite weather conditions and the much larger area set aside for the crop of 1894 would make some amends, in quantity at all events, has been fully realised, according to the estimates now furnished. These place the amount of hay secured in Great Britain generally in 1894 not only largely beyond the produce of the year of drought, but, taking England alone, at quite double the amount of clover hay, and nearly three times the amount of hay from permanent grass which was obtained in 1893. The yield per acre of both forms of hay comes out considerably above the mean of the nine years 1886-94, for which records exist in all divisions of Great Britain. As regards

the crop cut from clover and artificial grasses, the estimates are as follows:—

Hay from Clover and Rotation Grasses.	Estimated Total Produce.		Estimated Yield per Acre.		Average Yield per Acre, 1886-94.
	1894.	1893.	1894.	1893.	
	Tons.	Tons.	Cwts.	Cwts.	Cwts.
England - - - - -	2,524,000	1,248,000	32·4	16·7	28·1
Wales - - - - -	233,000	126,000	27·4	14·9	23·1
Scotland - - - - -	691,000	544,000	35·1	28·5	30·7
GREAT BRITAIN -	3,448,000	1,918,000	32·5	18·7	28·2

The increase in the case of hay from permanent grass is still greater than that shown for clover hay in the above table, and presents the following results:—

Hay from Permanent Grass.	Estimated Total Produce.		Estimated Yield per Acre.		Average Yield per Acre, 1886-94.
	1894.	1893.	1894.	1893.	
	Tons.	Tons.	Cwts.	Cwts.	Cwts.
England - - - - -	6,121,000	2,189,000	29·3	12·1	24·3
Wales - - - - -	569,000	268,000	22·3	10·7	18·2
Scotland - - - - -	252,000	224,000	31·0	27·2	28·9
GREAT BRITAIN -	6,942,000	2,681,000	28·6	12·6	23·9

II.—THE FERTILISERS AND FEEDING STUFFS ACT, 1893.

By the Fertilisers and Feeding Stuffs Act, 1893, it is provided that the district analysts appointed under the Act by county councils and by councils of county boroughs shall report to the Board of Agriculture as they direct the results of any analyses made by them in pursuance of the Act.

In a circular (A $\frac{34}{c}$) issued on March 2nd, 1894, the Board accordingly requested the several local authorities in Great Britain to instruct their district analysts to furnish to the Board quarterly reports, made up to the last day of March, June, September, and December respectively in each year, upon the analyses of (1) fertilisers and (2) feeding stuffs made by them.

The total number of analyses made under the Act in Great Britain during the twelve months ended December 31, 1894, as reported by the district analysts, was 444, comprising 317 of fertilisers and 127 of feeding stuffs. The number of samples analysed in England, Wales, and Scotland respectively is shown in the following table:—

—	Number of Samples analysed.		
	Fertilisers.	Feeding Stuffs.	Total.
England, counties - -	146	67	213
„ boroughs - -	4	7	11
Wales - - -	6	—	6
Scotland - - -	161	53	214
GREAT BRITAIN - -	317	127	444

Taking the reports for the four quarters of the year, the number of analyses made in the three countries was as shown below:—

—	Fertilisers.				Feeding Stuffs.			
	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.
England, counties -	3	110	24	9	2	12	23	30
„ boroughs -	—	2	—	2	—	—	—	7
Wales - - -	—	1	—	5	—	—	—	—
Scotland - - -	30	123	4	4	15	14	13	11
GREAT BRITAIN -	33	236	28	20	17	26	36	48

The extent to which the Act was put into operation in 1894 in the counties of England, Wales, and Scotland may be seen from the following statement, which shows the counties in which analyses were made, and the number of samples of each class analysed.

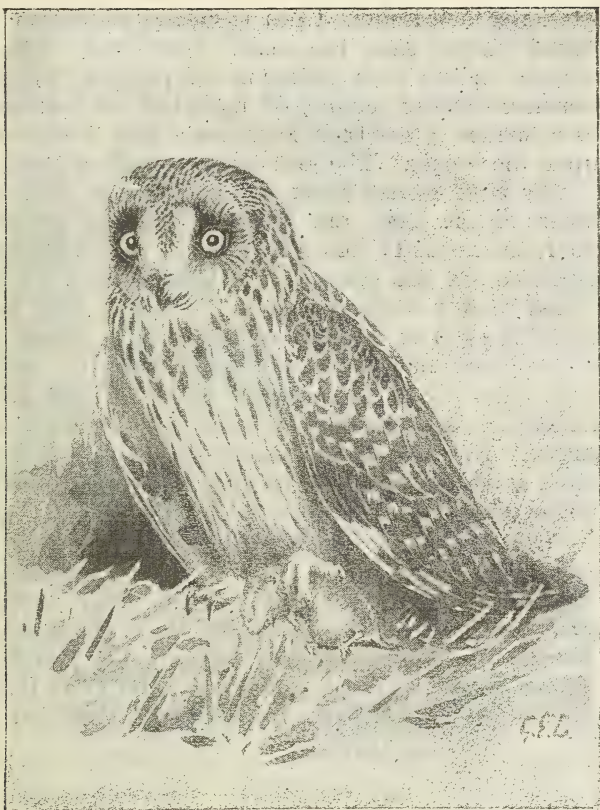
Counties.	Date of Approval of Analyst's Appointment.	Number of Samples analysed.		
		Fertilisers.	Feeding Stuffs.	Total.
ENGLAND:—		No.	No.	No.
Chester - - -	23rd February 1894 -	4	4	8
Cumberland - - -	31st March 1894 -	8	1	9
Devon - - -	24th April 1894 -	13	4	17
Dorset - - -	31st March 1894 -	—	1	1
Durham - - -	17th April 1894 -	2	1	3
Essex - - -	27th January 1894 -	1	—	1
Gloucester - - -	6th April 1894 -	1	—	1
Hants - - -	8th March 1894 -	2	—	2
Hereford - - -	3rd April 1894 -	4	—	4
Hertford - - -	11th June 1894 -	1	—	1
Kent - - -	10th March 1894 -	14	4	18
Leicester - - -	13th January 1894 -	—	2	2
Lincoln, parts of Kesteven -	27th February 1894 -	2	—	2
" " Lindsey -	23rd February 1894 -	2	1	3
London - - -	5th March 1894 -	1	2	3
Monmouth - - -	18th April 1894 -	15	8	23
Norfolk - - -	15th December 1893 -	8	3	11
Northumberland - - -	26th February 1894 -	1	—	1
Salop - - -	22nd March 1894 -	32	11	43
Somerset - - -	20th January 1894 -	13	12	25
Stafford - - -	25th November 1893 -	2	—	2
Surrey - - -	27th March 1894 -	1	—	1
Sussex, Eastern Division -	26th February 1894 -	7	3	10
" Western -	22nd February 1894 -	4	—	4
Warwick - - -	24th February 1894 -	1	—	1
Westmoreland - - -	30th May 1894 -	3	6	9
Wilts - - -	18th April 1894 -	—	2	2
Worcester - - -	13th January 1894 -	2	2	4
York, West Riding -	7th May 1894 -	1	—	1
Soke of Peterborough -	18th January 1894 -	1	—	1
County Borough:—				
Newport, Mon. - - -	17th April 1894 -	4	7	11
Total England - - - -		150	74	224
WALES:—				
Cardigan - - -	25th April 1894 -	1	—	1
Carmarthen - - -	22nd October 1894 -	2	—	2
Montgomery - - -	26th July 1894 -	2	—	2
Pembroke - - -	30th May 1894 -	1	—	1
Total Wales - - - -		6	—	6
SCOTLAND:—				
Aberdeen - - -	12th June 1894 -	3	—	3
Ayr - - -	3rd January 1894 -	36	—	36
Banff - - -	27th March 1894 -	10	2	12
Berwick - - -	14th February 1894 -	—	1	1
Caithness - - -	16th January 1894 -	—	1	1
Dumbarton - - -	26th February 1894 -	2	—	2
Dumfries - - -	27th January 1894 -	7	1	8
Fife - - -	26th January 1894 -	3	9	12
Forfar - - -	22nd June 1894 -	2	8	10
Kincardine - - -	27th March 1894 -	9	—	9
Kinross - - -	2nd June 1894 -	2	3	5
Kirkcudbright - - -	6th January 1894 -	17	9	26
Lanark - - -	26th February 1894 -	12	1	13
Linlithgow - - -	13th June 1894 -	—	1	1
Midlothian - - -	24th April 1894 -	5	3	8
Perth - - -	10th January 1894 -	40	10	50
Renfrew - - -	3rd April 1894 -	7	—	7
Stirling - - -	2nd February 1894 -	2	4	6
Wigtown - - -	11th January 1894 -	4	—	4
Total Scotland - - - -		161	53	214
Total GREAT BRITAIN - - -		317	127	444

III.—THE SHORT-EARED OWL.

Otus brachyotus (Strix brachyotus).

The Short-Eared Owl is different in its habits from other owls found in Great Britain, which live in thick woods and plantations, or in barns, churches, and ruins, and seldom leave their retreats during the day. The haunts of the Short-Eared Owl are heath and moorland, marshes, furzy downs, meadows, turnip-fields and open places, principally in the north of England and Scotland, though it is found occasionally in many English counties. It flies in the daytime, and may be seen hunting for mice, voles, and other vermin at all times of the day. Prentis, in his *Birds of Rainham* (Kent), says that the short-eared owl is not uncommon and comes in the autumn. It visits the marshes, where it is safe, nearly every year. When partridge shooting, these owls have been met with in Kentish turnip fields. On one occasion a pair nested and succeeded in hatching their young on an island marsh which had been lying idle throughout the winter and spring. But this owl, being migratory, does not, as a rule, breed in Great Britain, and leaves this country at the beginning of the spring for many other countries, so that, to use Seebohm's words, outside our islands its range is almost cosmopolitan. It is found in such different latitudes as the Sandwich Isles and Greenland. Sometimes, however, as ornithologists relate, its nest is found in this country, especially in districts where there has been an extraordinary supply of its favourite food—mice, voles, or rats. In Gloucestershire, for example, when there was a great plague of mice in the Forest of Dean, the Short-Eared Owl was attracted there in large numbers and materially assisted in destroying the intruders.

In the recent visitation of field voles in some districts in the south of Scotland, unusual numbers of the Short-Eared Owl appeared upon the scene and nested there. The Departmental Committee appointed, in 1892, by the Board of Agriculture to inquire into this Plague of Field Voles say in their report, "This bird, which is distributed over almost every part of the globe, is a normal winter migrant to these islands, appearing simultaneously with the woodcock (whence it is popularly known as the "woodcock owl") and usually departing in spring. Nests in ordinary seasons are of comparatively rare occurrence in Great Britain, but in consequence of the vast multiplication of their favourite food, the vole, these owls have not only arrived in unusual numbers but have remained and bred freely all over the district affected, laying from 8 to 13 eggs (though Newton in his edition of Yarrell's "British Birds" mentions seven as an unusual number) and rearing more than one brood. The shepherd



THE SHORT-EARED OWL.

Otus brachyotus (Strix brachyotus).

on Crooked-Stone, near Crauford, has counted 14 nests on his ground. The small wood behind the farmsteading of Howpasley presented a remarkable appearance, the ground being densely covered with the "pellets" or "castings" of owls composed of the fur and bones of the voles."

The Committee were of opinion that it would be difficult to condemn too severely the foolish and cruel action of those who allow or encourage the destruction of this useful and beautiful family of birds, and it was with much satisfaction that they were able to record that many landowners and game preservers had become convinced in late years that owls of all sorts are not only harmless to game, but most beneficial to agriculturists, and had issued orders for the preservation of these birds. Seebohm also is very strong on this point, and says, "Too often, however, the poor harmless owl is shot down by the thoughtless farmers, or ignorant gamekeepers, who foolishly imagine they are ridding the domains of a pest, although in reality they are taking the life of one of their most valuable friends."

The Short-Eared Owl is from 14 to 15 inches in height. The female is rather larger than the male. The head, back, and wings are lightish brown with darker brown patches upon them. The wing feathers have an edging of light buff or fawn colour, and the under surface of the body is of this colour with blackish markings upon the breast. The legs are pale buff coloured with black toes. The beak is also black, and the ears, as well as the tufts of feathers on the head, are brown. The eggs are creamy white in colour, and about $1\frac{3}{4}$ inches long by $1\frac{1}{4}$ inches in breadth. They are deposited on the ground in a nest scooped out of the earth and lined with a little dry grass or moss. The nest is made generally in tufts of heather or furze, or in grassy spots. Sometimes it is found in marshy and fenny spots in reeds and rushes. Nests have been occasionally found in the Kentish marshes on little hillocks covered with rushes. From four to seven eggs are generally laid, but, as was shown by evidence before the Committee cited above, as many as 13 eggs have been found in a nest. Seebohm, in his "Far Countries of North America," quotes Richardson to the effect that this species of owl lays as many as 10 to 12 eggs. The Short-Eared Owl is much appreciated in Germany, where it is called the "moor," "fen," and "meadow" owl. It occasionally breeds in Germany as in England, but generally arrives in September and remains till March. In France it breeds in the Pyrenees, Charente Inférieure, Herault, Tarn, Aude, and other Southern Departments, but not very extensively.

IV.—THE DUCK-FATTENING INDUSTRY AT AYLESBURY.

In a Report by Mr. Aubrey Spencer to the Royal Commission on Agriculture, relating to the condition of agriculture in the Vale of Aylesbury, there is some interesting information as to the duck-fattening industry in that district. It appears that the persons who engage in duck fattening in Aylesbury and the surrounding villages are generally men of the labouring class or small village tradesmen. The number of ducklings reared and sold annually by individuals varies from a few hundred to several thousands. The ducks, which are always of the large, pure white, or Aylesbury breed, require constant care and attention all through the spring months, and no one who rears a large number would, during that period, have time to engage in any other work. But where a comparatively small number is reared, the female portion of the household do most of the necessary work. Many of those engaged in rearing are said to find time to carry on some other occupation, such as shoe-making, in the autumn months, or, at any rate, to earn a little extra money by harvesting and occasional agricultural work. Mr. Spencer was told that in the village of Weston Turville about 11 men fattened 1,000 ducks a-piece annually, and that about 16,000 or 17,000 were sent from there to London in a year. As a rule, the duck fatteners do not themselves keep stock ducks, but buy eggs from farmers or others who keep breeding ducks, so that the breeding and rearing are in different hands.

It is a main object of the duck fatterer to bring out as many young ducks as he can ready for the market in February or early in March when the game season is over, and the highest prices are obtainable for ducklings. The season for ducklings commences in February, and continues till about the end of August, the prices falling as the year advances. In February or March, as much as 1*l.* 1*s.* a couple is occasionally obtained for ducklings, and one fatterer at Weston Turville informed Mr. Spencer that in 1894 he had obtained the very exceptional price of 24*s.* for a couple, which was the highest figure he had ever reached. The average price in March is stated to be more usually about 12*s.* or 14*s.* a couple. The carriage and salesman's commission for the ducklings (5 per cent.) are reckoned at about 3*d.* a bird, and duck fatteners commonly estimate that, after deducting carriage and commission, they receive on the average about 3*s.* 3*d.* a duck. Mr. Spencer, however, is inclined to think that this estimate is rather under than over the mark, for in August, when he visited the district, prices were still as high as 6*s.* to 7*s.* a couple.

As regards accommodation, it appears that a small back yard or garden attached to a cottage affords sufficient room for the

bringing-up of some hundreds of ducklings. Some shedding is required for the protection of the young ducks from the weather, and the ground is usually divided by planks into pens so as to keep the ducklings of different ages apart. As a rule, the young ducks do not go into the water, but are supplied with water in troughs or shallow vessels.

Duck fatteners have to pay highly for sittings of eggs and sitting-hens early in the season. Sometimes as much as 8s. to 12s. is paid in January for a sitting of eggs warranted fertile, and 4s. for a hen. The food for the young ducks consists principally of chopped eggs, rice, greaves, and barley meal. For the rice, about 16s. per cwt. is paid; for greaves, 12l. to 17l. a ton; and for barley meal, 9s. a sack. A duck farmer at Haddenham, who fattens about 3,000 ducks annually, informed Mr. Spencer that he reckoned his outlay on greaves in 1894 at 100l., on barley meal at 200l., and on rice at 9l. He said that he owned his own house, and land of about four acres in extent. He employed regularly one man to help him with the ducks. He kept about 60 stock-ducks for laying, and had a horse and cart for taking the ducklings to the station. He also collected and forwarded to London ducklings reared by other people in the neighbourhood, who did not possess a cart of their own, charging 1d. a duck for collection and carriage. He added to his "ducking" business, the buying of feathers from other people, and he also sold hens' eggs. His view of the business generally was, "We pay our way, but do not make a fortune." It seems that the young ducks require the closest and most careful attention during the fattening season, especially in the early months when the weather is cold and inclement. Even with the greatest attention, a certain proportion are always lost, and there is a risk of occasional large losses owing to disease or unhealthy conditions. A rearer at Weston Turville is said to have lost 1,000 out of 2,000 ducks from disease in 1893. The ducklings are killed when 8 to 10 weeks old, and are sent to London plucked.

Duck fattening has long been carried on in the district, and at Haddenham Mr. Spencer was told that "everybody seems to go in for it. Many farmers have taken to it on account of the bad times," and it was stated that prices had fallen on account of the increased competition. Mr. Spencer is of opinion that notwithstanding this, and in spite of the somewhat heavy expenses and frequent risks which attend upon the industry of duck fattening, it pays very fairly if practised with skill. The fact that the industry has increased is said to point to this conclusion.

The duck rearers do not appear to suffer to any great extent from difficulties in the way of disposing of their produce. The ducklings are consigned to salesmen in Leadenhall Market, who return to the rearers the price made less 5 per cent. commission. It is said to be always easy to dispose of the ducklings, and

there are many salesmen who are willing to take them, so that if any rearer is not satisfied with the dealings of any particular salesman he has only to send his ducks to another.

In respect of the question whether this more or less flourishing industry could be extended to all other parts of the country, Mr. Spencer thinks it will be evident that the industry could not be largely extended without lowering the prices at present obtained, and he is inclined to doubt if duck rearing, which is attended with considerable expense as carried on in the Vale of Aylesbury, would be remunerative if that were the case. According to the view of the local duck-rearers the water and soil of the Aylesbury district are exceptionally suitable to duck rearing, and there is a local gravel obtainable at Burton and Long Marston, near Aylesbury, which is said to be essential to the health of the ducklings.

V.—AGRICULTURE IN VICTORIA.

The Board of Agriculture have lately received the final Report of the Vegetable Products Commission of the Colony of Victoria, which was appointed to inquire into, and report on, the vegetable products, other than wheat, for the growth of which the climate of Victoria is suitable, both with and without irrigation.

The main reason for the appointment of the Commission was that it was foreseen in 1883 that a considerable fall in the price of farm produce, particularly wheat, would take place in the near future, and it was deemed desirable, therefore, that Victorian farmers should turn away, to some extent, from the growth of that cereal, with a view to the cultivation of other and more remunerative crops.

The Commissioners sat from the 7th September 1885 to the 24th June 1892 ; they held 82 sittings, examined 173 witnesses, visited nearly all the principal agricultural centres of Victoria, as well as Sydney and Adelaide, and thus collected a large amount of valuable information.

The final Report contains references to the numerous recommendations previously made by the Commission with the object of inducing Parliament to offer bonuses for the encouragement of certain rural industries and for other purposes.

First in importance comes the butter industry, which is one of the fruits of the bonus system adopted on the recommendations of the Commission. As an example of the remarkable position occupied by this industry, statistics are quoted showing that in the year ending 1st March 1893 there were 86 butter factories in operation in Victoria, yielding the large total of 13,189,766 lbs. of butter, while on private farms a production of 10,320,079 lbs. was recorded. Attention is also directed to the fact that within the last few years 116 creameries have been established.

Allusion is made in the Report to the astonishing progress which has been made of late years in the exports of dairy produce. The shipments of butter in each of the four seasons from 1889 to 1893 are stated to have been as follows:—828,822 lbs. in 1889-90 ; 1,700,596 lbs. in 1890-91 ; 4,792,513 lbs. in 1891-92 ; and 8,094,255 lbs. in 1892-93. Seeing that the average prices realised in the London market have been remunerative, there is, it is observed, every reason to believe that this trade is established on a thoroughly permanent footing, and that Victoria is now able to compete successfully with other foreign producers in the world's markets without any further assistance from the State.

It is further stated that the manufacture and export of cheese are progressing satisfactorily, though not as yet with so pronounced a success as in the case of the butter industry. In 1893, there were 14 factories in operation, turning out 946,531

lbs. of cheese, to which must be added a further quantity of 311,046 lbs. returned from private farms. The development of this important branch of agriculture had been somewhat retarded owing to the defective methods previously adopted by Victorian cheese-makers. In order to remedy this, the Colonial Government have obtained the services of a cheese expert thoroughly acquainted with the Canadian method (which has been adopted so successfully in New Zealand) with beneficial results, and hope is expressed that this industry will soon become almost as important as that of butter-making.

As regards fruit-growing, the Commissioners are of opinion that everything possible should be done to encourage this important industry. One circumstance which is said to hold out substantial encouragement to perseverance with this industry, is the fact that Victoria, owing to its antipodean situation, is able to produce, and put on the foreign markets in the northern hemisphere, prime and fresh fruit in excellent condition at a time when the best qualities would necessarily be scarce in those markets, and would, doubtless, yield very satisfactory prices. It need hardly be said that for the realisation of successful and remunerative exportation, particular attention is directed to the necessity of cheap freights and skilful and careful packing by the most approved methods in suitable cases or receptacles.

The preservation of Victorian fruits, one of the most important branches of which is fruit-canning, is stated to be making satisfactory progress. A considerable sum has been paid by the Department of Agriculture in bonuses for exported canned fruits; and although the results are not considered to be up to expectations, the Commissioners are convinced that a little determination, coupled with the expenditure of a moderate amount of capital, would be sure to meet with success.

The necessity for the cultivation of root crops and other fodder, for the fattening, all the year round, of stock intended for the frozen meat export trade, is said to be rapidly making manifest the wisdom of the State expenditure on irrigation-work (for some fodder cannot be raised in many parts of the colony without irrigation), and it is certain that the demand for summer fodder for this purpose will soon be enormous. There is no reason, it is added, why the colony should not be a larger exporter of beef, mutton, pork, bacon, hams, and poultry, and there is said to be nothing that will be such a help to the Victorian farmers at the present time as the development of this important trade.

The Commissioners are of opinion that the importance of prompt and united action by the Australian colonies for the purpose of establishing recognised Australian markets in Europe, Asia, North America, and Canada for the exhibition and sale of Australian products cannot be over-estimated. They recommend that such markets should be established in London and other British cities, in Paris, Berlin, Vienna, Rome, New York, and elsewhere, so that

the inhabitants of those cities may be enabled to obtain first hand Australian produce of the best quality at the cheapest rates. It is urged that a beginning in this direction might with advantage be made in London, and that if this be done, the system will soon spread in the other directions indicated.

Among many recommendations with which the Report concludes, the Commissioners suggest that annual conferences of specialists in agriculture, horticulture, &c., be held to consider the various important rural questions, and that the proceedings be published. The bonus system having been so thoroughly successful during the last six years, its continuance is recommended to encourage the production of new vegetable products, and, where necessary, for the improvement of vegetable products already established, as well as for the establishment of factories for transforming the raw material into the manufactured article. The Commissioners also suggest such tariff alterations as will lead to the improvement and development of rural industries; that the railway freights be as low as possible to encourage production; that cool air and other trucks be provided for the safe carriage of vegetable products, and that cheap over-sea freights be arranged, and suitable accommodation made on board ship for the transport of Victorian products.

The Commissioners further recommend the encouragement of the frozen meat industry; the speedy establishment of additional agricultural colleges in the cooler districts of the colony, and of a central agricultural college, which would be the University of Agriculture of the colony, where the more promising students from the other agricultural colleges would be trained as specialists in the various branches of science bearing upon agriculture.

VI.—MARKET-GARDENING.

The area of market-gardens in Great Britain has been largely extended during the last 20 years. In 1875 there were 38,957 acres of market-gardens in Great Britain; in 1885 there were 59,473 acres, and the returns for 1894 show in that year 88,210 acres under this heading. This, of course, applies only to market-gardens proper, and is exclusive of the large acreage cropped with vegetables on farms, which fluctuates with seasons and prices.

The industry of market-gardening has suffered from adverse climatic influences during the last two years. In 1893, the excessive drought materially affected the growth and development of succulent vegetables; while the abnormal spring frosts and deluges of rain in 1894 were prejudicial to the production of the more delicate market-garden crops, such as peas, French beans, onions, lettuces, and other "salads," though in this last year cabbages, greens, sprouts, and all vegetables of the Brassica tribe were most abundant, and, in many cases, were produced at a loss. It may be said of the past season that it was the worst that market-gardeners have experienced for many years.

In recent years, farmers in many parts of the country have been keen competitors with market-gardeners in growing the more easily raised vegetables, especially greens and cabbages of all kinds. In respect of these, farmers have the advantage of being able to utilise such vegetables for feeding to stock if the markets are at any time glutted. Before this competition had set in, it frequently happened that market-gardeners made large profits in the spring from "coleworts," which are very young cabbages, and from cabbages with formed hearts somewhat later on. But in these days, the farmers are alive to the importance of this trade. Cauliflowers and other "green-stuff" come also from abroad before coleworts and cabbages are ready in our market-gardens.

Farmers, especially those near railways in direct communication with good markets, also grow, to a considerable extent, peas for podding, broad beans, turnips and turnip-greens, and early potatoes. They have not yet cultivated, at least in any important degree, those vegetables which require a great deal of labour, such as onions, carrots, parsnips, cucumbers, French beans, radishes, &c.; with respect to these, however, the market-gardeners are more or less severely interfered with by foreign supplies, which grow larger year by year.

Foreign competition has also made itself felt in respect of early vegetables and salads, which are imported some weeks before those grown in England are ready for market. Early

turnips, carrots, peas, and French beans from France, the Canary Islands, Madeira, and Algeria arrive long before English market-gardeners can supply these vegetables, and when their own expensive crops are ready. the fancy prices have passed into foreigners' pockets, and, as market-gardeners say, the "edge of the appetite for this early produce has been taken off." The same applies to salads, notably to lettuces, which are imported in large quantities from France and the Canary Islands as early as January, months before English market-gardeners can send them into market. This importation continues until June, when the demand for young crisp lettuces has been satisfied. A few years ago, cucumbers yielded considerable profits to home-growers; but now they are imported so early and so largely from Holland, and are usually so plentiful and cheap, that many market-gardeners in Great Britain have ceased to grow them. Radishes, another very profitable crop in past years, are sent in quantities from February to April from Paris, St. Malo, and the Channel Islands, completely forestalling English produce. Very large importations are made from Holland of beetroot and red cabbage for pickling, which until recently were profitably cultivated in England.

But it is in the case of onions that there has latterly been the most extraordinary increase in importation. Onions were regarded as an almost safe-paying crop if the weather were favourable, but in the last two years prices have been so forced down by foreign competition that in many years, especially in 1894, the growers have lost heavily. In some instances, it was impossible to dispose of onions in the last season.

In 1875, 169,456 bushels of onions, valued at 321,316*l.*, were imported into Great Britain, mainly from Holland, Belgium, France, and Portugal; Holland being by far the largest exporting country. The amount of this importation in 1884, was 3,474,746 bushels, valued at 481,427*l.*, from Germany, Holland (which sent 1,481,543 bushels), Belgium, France, Portugal, Spain, Italy, and Egypt. In 1894, no less than 5,288,512 bushels of onions, of the value of 765,049*l.*, came from abroad.

It is noteworthy that the imports of onions from Holland have considerably decreased since 1885, but those from Germany, France, and Spain have much increased. The receipts of onions from Egypt have more than quadrupled in the past decade.

Potatoes, again, were formerly important sources of profit to British market-gardeners. Early and quick-growing varieties were put in and dug early to supply the demand for new potatoes, and other crops were got in and taken off during the autumn. Importations of very early potatoes from Algeria, France, Lisbon, Malta, Teneriffe, and Holland interfere much with English growers of potatoes, and threaten to interfere with potato-growers in the Channel Islands, whose potatoes are not ready in any quantity until the first week in May. The arrivals of new potatoes commence about Christmas-time and continue in

increasing quantities until the Channel Islands season begins. The average importation of potatoes for the first six months of the last three years from France, Lisbon, Canary Islands, Malta, the Channel Islands, and other countries was 1,764,258 cwts., of an average value of 710,586*l*.

The importation of potatoes from the Channel Islands begins in May and continues until August. The average quantity of potatoes imported from this source for the four months—May, June, July, August—of the last three years was 1,171,216 cwts. of an average value of 521,141*l* for each of the three periods.

The average annual importation of potatoes of the last three years from all parts of the world to this country amounted to 2,846,754 cwts., of an average value of 962,458*l*.

The volume of imported potatoes has, however, decreased considerably during the past quarter of a century, and the character of the trade has changed in a great and significant degree. For the three years ending 1875, the average annual importation of potatoes was 5,363,136 cwts. For the three years ending 1885, the annual average importation was 3,297,867 cwts. Since 1880, some of the large importing countries which formerly sent potatoes in the late summer and autumn have greatly diminished their supplies as they could not compete with the English main-crop produce. But from the Canary Islands, the Azores, Malta, Spain, and the south of France, and other sources, steady supplies of new potatoes have been sent.

Besides the new potatoes and onions imported, large quantities of raw, unenumerated vegetables, such as peas, French beans, lettuce, and other “salads,” cauliflowers, spinach, beetroot, radishes, turnips, and cucumbers, are sent from Denmark, Germany, Holland, France, Portugal, Madeira, Spain, Canary Isles, Italy, Austrian Territories, Roumania, United States, and other countries. The average annual value of these imported vegetables during the past three years was 1,027,411*l*. In 1885, the value of these raw vegetables was 467,287*l*., while in 1875, it was only 132,124*l*., divided mainly between Holland, France, and Germany.

This importation of raw vegetables is spread fairly evenly over each month in the year, though it is somewhat larger in June, July, and August. It interferes materially with the prices of *primeurs* in the early spring months, and it is from *primeurs* and delicate vegetables and salads that market-gardeners have hitherto made their chief gains. Some profit is still made from young “bunching” onions, in May and June, as onions are not imported in this form. These are now, however, produced by farmers who, as a market-gardener remarked lately, “are driven into it and look over the hedge and try to imitate their neighbours.” Until a few years ago, celery was a very paying crop, realising gross returns of 40*l*. to 70*l*. per acre, when it was grown by comparatively few *bonâ fide* market-gardeners. Now it is grown by farmers, and upon sewage farms, so that

prices have fallen, and in some seasons the markets are oversupplied. Large quantities of celery are now grown in Yorkshire and Lincolnshire. In some districts, asparagus was formerly produced with considerable profit to the growers, especially for the first fortnight or so of the season, but the importation of asparagus from Toulouse, Dijon, Paris, and parts of Spain, which begins in January and continues until about the time when English asparagus is ready, has in recent years rendered this crop less profitable.

The high rents of market-garden land near London, in Middlesex, Essex, Kent, and Surrey, as well as the dearth and scarcity of labour, also handicap the industry. This applies to all market-gardens near large centres of population where the labourers can get good wages in gasworks, on railways, and in various other employments. Near London and other cities, women, whose labour is most useful in some of the processes of cultivation and after-management of vegetables, are becoming more and more disinclined to work on the land. In the production of such crops as onions, carrots, celery, and lettuce a great deal of labour is absolutely essential, not only for their cultivation, but also for preparing them for market, and in this respect farmers in many localities would have a considerable advantage. Market-gardeners in the vicinity of London and other populous places are able to cart their vegetables to market in their own conveyances. Farmers who live near railways communicating directly with markets are able to consign large quantities of vegetables at fairly reasonable rates, though they and market-gardeners complain of the rates charged for small consignments of their produce.

Technical knowledge is necessary in the production of vegetables. Some market-gardeners are particularly clever, energetic, and hardworking, always on the look out for some new "idea," and many of them, from their connexion with salesmen and their propinquity to towns, are in close touch with the vegetable markets, and are well and regularly posted up as to supply and demand. In these respects, they have a certain advantage over farmers, who do not, as a rule, care about small details, and would not have such opportunities of getting information as to immediate and prospective market wants. But where technical knowledge may be easily obtained, as well as reliable and continuous information concerning the state of markets, and, it will pay to grow vegetables, farmers will no doubt adapt themselves to circumstances rendered necessary by the exigencies of the times.

There appears to be some opening for the further cultivation of tomatoes under glass. It would seem to be generally admitted that the climate of this country is too uncertain to permit of their successful cultivation in the open. A large and increasing business is carried on in the Channel Islands in growing tomatoes, in cheaply-built glass houses, for the English markets. The

cultivation of this vegetable is simple and profitable, and in view of the increasing demand, it may be worthy of the attention of British farmers.

Market-gardeners have done best who grow fruit and vegetables together, in localities distant from London, and near railways communicating readily with Manchester, and Birmingham, as well as the Metropolis. Flowers and tomatoes are also grown occasionally, as well as herbs and salads, so that there is almost always something to send to market. In some of these favoured districts, as Pershore and Evesham, for example, there has been a large increase in the acreage of market-garden land, and the demand for, and the price of, suitable land have increased. But even here, there has been a marked falling-off in profits in the past two years, and the cultivators are somewhat discouraged, and are re-arranging their rotations to suit altered conditions.

VII.—EXPORTS OF BRITISH CATTLE IN 1894.

An export trade in high-class breeding stock to distant countries has always been a feature of British agriculture, testifying to the appreciation of our animals by the agriculturist of other countries. There is more novelty in the apparent growth of sales of store, half-fat, or finished beef cattle to replenish the ordinary food supply of European countries. In a year in which it has been observed that the total of our yearly export trade in horses fell distinctly below the level of recent seasons, so far as value is concerned, the trade accounts for 1894 indicate that a noteworthy increase was visible in the exports of British cattle, especially to our nearest European neighbours.

The customary exports of cattle from the United Kingdom do not, it is true, reach any considerable total, but they have risen in number and in aggregate value in each of the past five years, as under :—

Years.					Number.	Value.
						£
1890	-	-	-	-	1,245	49,655
1891	-	-	-	-	1,402	41,034
1892	-	-	-	-	2,403	55,475
1893	-	-	-	-	3,109	65,477
1894	-	-	-	-	8,281	135,317

The doubling of the export trade between 1890 and 1892 occasioned little remark, as the addition only replaced the figures at about the level occupied in 1888, although the character of the trade was changed and the value per head fell from 40*l.* to 23*l.* All through the year 1893, however, a continuous increase of foreign buying was reported, and the total for the year was almost as large as in 1884. The advance of last year, however, carried the totals considerably beyond the hitherto remarkable year 1883, the number being between six and seven times greater than in 1890, but the value dropping to 16*l.* 10*s.* per head.

Up to the end of the first half of 1894, the exports did not present much appearance of exceeding those of 1893, although, like those of that season, they were considerably above the figures for 1892. From August onwards to December, the monthly totals rose rapidly, and the presence of buyers from Belgium and France attracted attention in our southern markets. In the first half of 1894, the number of cattle exported was 1,281, and their value 25,880*l.* In the last six months of the year the number was 7,000, and their value 109,437*l.*

The following table, compiled from records supplied by the Commissioners of Customs, shows the numbers of cattle exported in each month of the past three years, and brings into special prominence the peculiarly active trade which distinguished the closing months of 1894:—

Months.					1892.	1893.	1894.
					No.	No.	No.
January	-	-	-	-	39	98	109
February	-	-	-	-	18	193	85
March	-	-	-	-	40	84	155
April	-	-	-	-	35	311	298
May	-	-	-	-	65	182	275
June	-	-	-	-	94	335	359
July	-	-	-	-	223	188	295
August	-	-	-	-	403	370	876
September	-	-	-	-	418	427	976
October	-	-	-	-	239	234	1,410
November	-	-	-	-	583	351	1,880
December	-	-	-	-	246	336	1,563
The Year - - - -					2,403	3,109	8,281

Details supplied as to the countries to which these increasing exports were sent, show that Belgium has been the largest purchaser. Her purchases were recorded in every month of the year, but only to a significant extent in the last four months, and chiefly in the last three, when 919, 1,423, and 1,181 head of cattle were respectively sent to Belgian ports. Altogether, the Belgian purchases accounted for more than half of the exports of the year, or 4,585 head, against 933 sent to Belgium in 1893, and 562 in 1892; while the class of stock taken is indicated by the average values 13*l.* 4*s.* per head in 1894, 12*l.* 4*s.* in 1893, and 18*l.* 5*s.* in 1892.

France came next after Belgium, taking 601 head of cattle from England, according to these figures, in 1894, whereas the number crossing the Channel to that country in previous years does not appear to have been sufficiently important to find a place in the annual returns. Germany, also, though on a smaller scale than France, has been a purchaser in our markets in the last four months of 1894, 330 of the exported cattle being credited to that country. The value of the cattle taken by France in 1894 from this country was 7,273*l.*, giving a mean of 12*l.* per head. Those going to Germany were valued at 21*l.* 17*s.* per head. These figures point to a wholly different class of business than the older form of export to new countries, such as Argentine, where we sent 285 cattle in 1893 valued at 61*l.* each on the average, and 167 in 1894 at 52*l.* 12*s.* each.

In view of the changed state of the course of trade, these statistics are possessed of considerable interest. It is not much more than ten years since France was an exporter to this country. As is well known, however, the Continent has lately suffered seriously from cattle diseases, and the drought

of 1893, which was so severely felt over Europe generally, has, no doubt, had its effect in reducing the live stock of other countries as well as our own. In France, in particular, the necessity of resorting to importation in the past year has been remarkably shown by the figures published for the foreign trade of that country in 1894, the cattle imports rising from 6,906 head in 1893 to 164,082 last year. Not only did she draw from her own dependencies of Algeria and Tunis 126,019 oxen, against 5,849 from these territories in 1893, but notwithstanding the existing duties on imports, her receipts of live cattle from the United States and Canada numbered 19,232 head, against only 201 in the previous year. At the same time, France imported nearly twice as many sheep as in 1893. Nearly three fourths of the 1,991,000 sheep which she received came from her own African possessions; but both Germany and Austria sent into France in 1894 rather a larger number of live sheep than Great Britain received from all quarters in the same year, although it may be remembered that our imports of sheep in 1894 were nearly eight times greater than those of 1893.

VIII.—REPORTS ON FOREIGN CROPS.

THE UNITED STATES HARVEST OF 1894.

The December, 1894, Report of the Statistician of the Department of Agriculture of the United States contains the final estimate of the acreage and yield of the principal crops of 1894.

The total area and production of the cereals, potatoes, and hay are shown below :—

Crop.	Area.		Production.	
	1894.	1893.	1894.	1893.
	Acres.	Acres.	Bushels.	Bushels.
Maize - - -	62,582,269	72,036,465	1,212,770,052	1,619,496,131
Wheat - - -	34,882,436	34,629,418	460,267,416	396,131,725
Oats - - -	27,023,553	27,273,033	662,036,928	638,854,850
Rye - - -	1,944,780	2,038,485	26,727,615	26,555,446
Barley - - -	3,170,602	3,220,371	61,400,465	60,869,485
Buckwheat - -	789,232	815,614	12,668,200	12,132,311
Potatoes - - -	2,737,973	2,605,186	170,787,338	183,034,263
			Tons.	Tons.
Hay - - -	48,321,272	49,613,469	54,874,408	65,766,158

As regards maize, the area planted was, in round numbers, 76 million acres, but severe drought and devastating winds are stated to have reduced the acreage harvested for its grain value from 76 million acres to 62,582,000 acres. Over 13,500,000 acres of this grain were cut for fodder.

The area under wheat has slightly increased, so that the reduction shown in the acreage of 1893 is not continued. The Statistician remarks that, in view of the extraordinary fall in the price of wheat, it is not surprising that correspondents of the Department should have exaggerated the tendency to reduce the area under this grain, the seeming imperiousness of the reason for doing so leading them to under-estimate the strength of the countervailing force exerted by fixed habit by the disposition to regard the low prices as a merely temporary phenomenon, and finally by that conservatism which in general is a characteristic of the farmer.

It will be seen that the hay crop of 1894, as compared with that of the previous year, shows a reduction of 1,292,000 acres. The principal cause of this decline was drought, though in some localities there were other contributing causes.

For fruits, the season of 1894 was a poor one, especially for the larger varieties.

THE WHEAT CROP IN INDIA.

The first general memorandum on the wheat crop for the season 1894-95, dated Calcutta, 28th December 1894, has been received from the Department of Revenue and Agriculture of the Government of India.

It is stated that the area sown in the Punjab is estimated at some 7·9 millions of acres, or little more than 3 per cent. below the very extensive area sown last year. In the North-Western Provinces the autumn rainfall spoilt a considerable proportion of the earlier sowings, and the area under wheat will probably be some 8 per cent. below that recorded for last season. The injurious effect of the monsoon has been felt also in the Central Provinces and Berar, and to this has been added in the Central Provinces the want of seed-grain entailed by the heavy losses from rust in the crop of 1894. In Southern Bombay, where rain has been unseasonable and insufficient, the sowings fell somewhat short of those of last year, but in the North, where wheat has largely replaced damaged cotton, the area is put at some 22 per cent., and in Sind, where floods have been extensive, at as much as 68 per cent., above the average.

So far as can be judged the out-turn in the Punjab, Northern Bombay, and Sind will be good, in Berar and the Central Provinces fair to good, and in the North-Western Provinces and Southern Bombay only fair.

RUSSIAN HARVEST OF 1894.

The Board of Agriculture have received from the Ministry of Agriculture at St. Petersburg a copy of a report containing the preliminary estimates of the yield of cereals in the fifty governments of European Russia in 1894. The estimated out-turn of the four chief grain crops in 1894 compared with the production of 1893 may be shown as follows:—

Crop.	1894.	1893.
	Bushels.	Bushels.
Wheat - - - - -	273,815,407	360,104,546
Barley - - - - -	180,887,192	284,166,730
Oats - - - - -	666,394,610	628,052,960
Rye - - - - -	795,879,180	706,404,367

AUSTRIAN HARVEST OF 1894.

The *Statistische Monatschrift* has recently published the results of the cereal harvest of Austria, as ascertained by the Imperial Ministry of Agriculture at Vienna. The particulars of the acreage and yield of the different grain crops are returned as follows:—

—			Area.	Production.	Average per Acre.
			Acres.	Bushels.	Bushels.
Wheat	-	-	2,712,339	46,698,905	17·22
Rye	-	-	4,819,943	82,249,447	17·06
Barley	-	-	2,805,697	58,632,832	20·90
Oats	-	-	4,641,154	106,134,875	22·86
Maize	-	-	805,669	13,435,977	16·68

SWEDISH HARVEST OF 1894.

The Board have received from the Swedish Ministry of the Interior a copy of the official estimate of last year's crops in that country.

The method of collecting the produce statistics in Sweden is as follows:—Since 1865 the provincial agricultural societies have published returns which are obtained directly from the farmers, and which contain, *inter alia*, the quantity of seed employed as well as of the crop obtained. These returns, however, are not published until one year or more after the harvest to which they relate. For this reason a system was adopted in 1874 by which the crop estimates are obtained immediately after harvest. The yield is estimated on the following principle:—the quantity of seed sown in each district being ascertained through the local agricultural societies, this quantity is multiplied by the number of times by which the seed is estimated to have increased in producing the crop. From the result thus obtained, combined with the reports of the provincial prefects, an estimate is made of the total crop.

The crops of 1894 are in this manner found to have been “almost above the average.” The yield of the most important cereals, with the exception of rye, was heavier than in the preceding years. The potato crop was, however, much below the average, and was besides of bad quality in many districts. The yield of hay and straw exceeded the amount required for home consumption.

The following table shows the estimated crop results of 1894:—

Crop.	Estimated Crop, 1894.		Average of Crops, 1884-93.	
	Hectolitres.	Bushels.	Hectolitres.	Bushels.
Wheat - - -	1,574,200	4,329,000	1,425,000	3,919,000
Rye - - -	6,694,700	18,410,000	7,810,600	21,480,000
Barley - - -	5,201,400	14,304,000	5,167,000	14,210,000
Oats - - -	24,638,800	67,757,000	20,836,300	57,300,000
Mixed wheat - -	3,399,300	9,348,000	2,740,500	7,536,000
Peas - - -	537,100	1,477,000	562,800	1,548,000
Beans - - -	79,200	218,000	82,500	227,000
Vetches - - -	282,800	778,000	259,800	714,000
Potatoes - - -	15,888,600	43,694,000	19,118,000	52,575,000

HARVEST IN MANITOBA IN 1894.

The Board have received an official report on the actual yield of the various kinds of grain, and the conditions prevalent during the last harvest and fall in Manitoba. It appears that favourable conditions obtained in the Province for the maturing of the crops, with the result that, in all districts, actual yields show a slight increase per acre of wheat over the crop estimates, to which reference was made in the last number of this Journal.

The following are the official figures relating to the wheat crop :—Area, 1,010,186 acres ; yield per acre, 17 bushels ; total yield, 17,172,883 bushels, or about 1,400,000 bushels above the estimate.

Oats, on the other hand, show a slight decrease from the estimate, the figures being as follows :—Area under oats, 413,686 acres ; average yield per acre, 28·8 bushels ; total yield, 11,907,854 bushels, compared with 12,197,772 bushels in the estimate.

The production of barley was 2,981,716 bushels, against an estimated yield of 2,182,520 bushels.

Other crops yielded as follows :—Rye, 59,924 bushels ; flax, 366,000 bushels ; peas, 18,434 bushels ; potatoes, 2,035,336 bushels ; and roots, 1,841,942 bushels.

CROP PROSPECTS IN FRANCE.

A Report on the state of the growing crops of wheat and rye in France, at the end of January last, was published in the "*Journal Officiel*" of the 14th February.

The Report, which is issued by the Statistical Department of the Ministry of Agriculture, is compiled from observations made and supplied by the departmental professors of agriculture. These individual reports are then tabulated by departments and by groups of departments, to show figuratively the current year's acreage compared with the last, as well as the state of the growing crops

For purposes of comparison, the figure 100 is taken to represent the area under the same crop in the preceding year ; and as regards the state of the young crops, 100 implies "very good" ; 80, "good" ; 60, "rather good" ; 50, "passable" ; 30, "middling" ; 20, "bad."

The following table gives the figures as regards wheat only, and the mean for groups of departments :—

Divisions.	Area under Wheat compared with 1894.	Condition of Crop at the End of January, 1895.
North-west region	98	76
North region	97	92
North-east region	100	94
West region	100	90
Central region	97	89
Eastern region	98	86
South-west region	98	91
Southern region	98	85
South-east region	93	89
Corsica	90	60

An analysis of the figures for each department shows that there has been an increase of wheat acreage, compared with the year 1893-4, in the following departments :—an increase of 20 per cent. in Maine-et-Loire, of 10 per cent. in Haute-Marne, of 5 per cent. in Calvados and Belfort (Haut-Rhin), of 4 per cent. in Basses-Pyrénées, and of 2 per cent. in Haute Garonne. In 35 departments, the acreage under wheat is the same as in the previous year, and there has been a diminution of from 1 to 5 per cent. in 37 departments. The decrease has been 8 per cent. in Eure; 10 per cent. in the Pas-de-Calais, Haute-Loire, and Corsica; 12 per cent. in Alpes-Maritimes; 15 per cent. in Gers and in Gard; 20 per cent. in Loir-et-Cher, and 25 per cent. in Bouches-du-Rhône.

As regards the condition of the crops at the end of January, the index number 100 was applied to 28 departments; 54 departments ranged from 99 to 80; and the crops of the remaining 5 departments were classed as follows :—Aveyron, 75; Loire, 65; Corsica, 60; Ile-et-Vilaine, 37; Côtes-du-Nord, 30.

IX.—INJURIOUS INSECTS AND FUNGI.

THE WOOLLY APHIS (*Schizoneura lanigera*, Hausmann).

Twig of apple tree with blight. Wingless viviparous female, woolly, with young. Oviparous female, woolly, and without beak or rostrum. Wingless male with long rostrum. Pupa, without wool.

This aphid, which is injurious to apple trees, is commonly known as American Blight, and was thus named because it was ascertained by Sir Joseph Banks that it was first seen in Great Britain upon apple trees consigned to an English nurseryman from America, towards the end of the last century.

Mr. Buckton observes in his "Monograph of British Aphides," that the ravages of this insect were at first confined to the vicinity of London; but the pest speedily spread into the Devonshire orchards, and with such effect that at one time the making of cider threatened to be abandoned. In Gloucestershire, the apple orchards were so infested by the Woolly Aphis in 1810 that no cider was made, and it was feared the trees were hopelessly injured. In the last few years, it has greatly increased in some of the British apple-producing localities, and it was particularly troublesome in many places in 1893.

The Woolly Aphis is found throughout Europe where apples are grown, in the United States, Canada, and Australasia. In Tasmania, New South Wales, and New Zealand it is very troublesome; and in Victoria, where it has been known for 40 years, it is a great scourge. As the eggs of the insect are placed in the interstices of the bark, the importation of apple trees from an infested country or district almost certainly entails the introduction of the pest.

Apple-growers may have frequently noticed bunches of a woolly or cottony substance on parts of the stem, branches, and twigs of apple trees, especially upon scars where the bark has been injured, or where side shoots and branches have been cut off in an unworkmanlike fashion, and the cuts made slanting upwards instead of downwards, so that wet has collected and caused decay, and cracks have formed which have increased in width and depth. The edges of the outer layers of bark do not join, and a thin tender tissue covers the exposed parts. Upon examination, the woolly substance upon these parts will be found to consist of little groups of larvæ clothed with fine woolly coverings, actively engaged in piercing these denuded surfaces with their suckers, and feeding on the sap, causing abnormal growth of tissue. Extravasation of sap occurs, giving rise to excrescences and warty growths, affording food and shelter for the numerous generations of larvæ, and eventually the whole branch is affected, and its vigour and fruitfulness materially impaired. The infestation spreads to other branches, and the smaller branches and fruit-bearing spurs are attacked. After an uninterrupted attack of these insects it often happens that the infested tree dies or becomes useless. Young trees are sometimes so weakened by the suckings of numerous woolly aphides that they do not recover.

The result of this infestation is often said to be "canker," occasioned by climatic influences, unsuitable soil or subsoil, or too much, or improper, pruning. But it is altogether different from canker, and close inspection will prove that the woolly aphis is the author of the mischief. Old neglected orchards, as too many unfortunately are, swarm with American blight, which has spread from branch to branch, from tree to tree, and from orchard to orchard, borne by the wind, unchecked and unheeded. It is sheltered by the lichenous and mossy growths upon the trees, and the thick interlacement of boughs and branches unpruned for generations.

Young trees planted in infested orchards and plantations are often ruined by the woolly aphides, brought by the wind or by the winged females. The bark of these trees is tender and easily pierced by the sharp beaks of the larvæ, and cannot long withstand their attacks.

Not only does the woolly aphis infest the stems and branches of the apple trees, but it also descends to the roots and feeds upon them, causing swellings, and injuring them in the same way as the upper parts of the tree. It has been suggested that the aphides merely go under the ground for shelter from cold, but the colonies found there were evidently engaged in extracting the juices from the roots. Besides, it has been proved that they can bear great cold. They have been seen flourishing under their woolly coverings in the cracks and crannies of the stems and branches after 12 degrees of frost.

Life History.

This aphid belongs to the genus *Schizoneura* of the *Aphididae*. It is quite distinct from another species of aphid, styled *Aphis mali*, which also infests apple trees. The *Aphis mali* is furnished with cornicles for the secretion of honey dew; the woolly aphid is without these appendages, and it differs also in many other respects.

The winged viviparous female is dark brown, having large wings with black veins. The cubital vein has only one fork differing in this from other tribes of the *Aphididae*. This form appears in the late summer, and has been found as late as September. From this form, egg-bearing, wingless females are produced without beaks, or rostra, and are therefore unable to feed. A female produces only one egg, which is very small, and is deposited in the crevices of the bark. Propagation, the regular continuity of existence, however, is principally carried on by means of the hibernating viviparous larvæ which pass the winter upon the trunks of the trees, their branches and twigs, as well as upon their roots. They are protected from cold by the bark, the folds of rind, and their own woolly coats. These wingless females are woolly, of a brown colour, and broad in shape, as shown in the illustration, which Mr. Buckton has kindly allowed to be copied from his Monograph of British Aphides. The young larvæ from these, which again reproduce larvæ, are at first rather lighter in colour, and after a time emit wreaths of woolly material from their dorsal pores and become fully covered, so that a group of them has the resemblance of a piece of cotton wool. The pupa is rather darker than the larva, is squat in shape, and without wool, while the wingless male is brown, without wool, and fully equipped with an efficient rostrum.

There appears to be no visible difference between the generations of this insect that are found upon the branches and the roots of apple trees.

Preventive and Remedial Measures.

Apple trees should be kept free from lichenous and mossy growths which serve as shelters for woolly aphides as well as for many other injurious insects. Lichens and mosses can be killed by throwing hot finely powdered lime over the trees during the winter, in damp weather, when the lime will adhere to the trees. This can be done with tin scoops fastened to the end of long poles. Sulphate of iron, dissolved in water at the rate of 1 lb. to one gallon of water, sprayed in winter over the trees by a powerful garden engine or hop-washer, will also kill lichens and mosses.

In young orchards, the apple trees should be carefully and systematically pruned from the beginning, so that boughs do not intertwist, and that plenty of air and light is afforded. Periodical search should be made for woolly aphides and other insects.

When the woolly aphid is discovered in old wounds on the stems and large branches, or other places where there are colonies of the insect, these parts should be treated with a compound of soft-soap and paraffin oil of such a consistency that it can be put on with a brush. Infested boughs and twigs should be syringed with a mixture of 5 or 6 lbs. of soft-soap and 5 gallons of paraffin oil to 100 gallons of water; or with the extract of 9 lbs. of quassia chips. These applications may be made in the autumn when the leaves have fallen, or in the early spring before the leaves have come forth. They can be put on young trees with a large garden engine or with what is known in hop districts as a "hop-washer." Other washes may be tried, but soft-soap should be their base.

In old orchards and plantations, in which pruning has been neglected and the trees densely crowded with intertwined branches, infested boughs and branches should be cut away as much as possible. Infested places and scars upon the trunks and stems, where colonies of woolly aphides congregate, must be scraped with a bark scraper, and fresh lime-wash brushed in vigorously. The thick soft-soap and paraffin composition would be more effective for this purpose, but it would perhaps be too expensive in the case of large trees.

Spraying with soft-soap and paraffin, or quassia washes, should be adopted for the infested branches of large trees, according to the receipt given above. If they are much intertwined they must be thinned out. In the hop districts of Kent, Worcester, and Hereford horse hop-washers have been used in orchards in a few instances with some advantage. In plantations hand-washers must be used with powerful pumps and long lengths of hose.

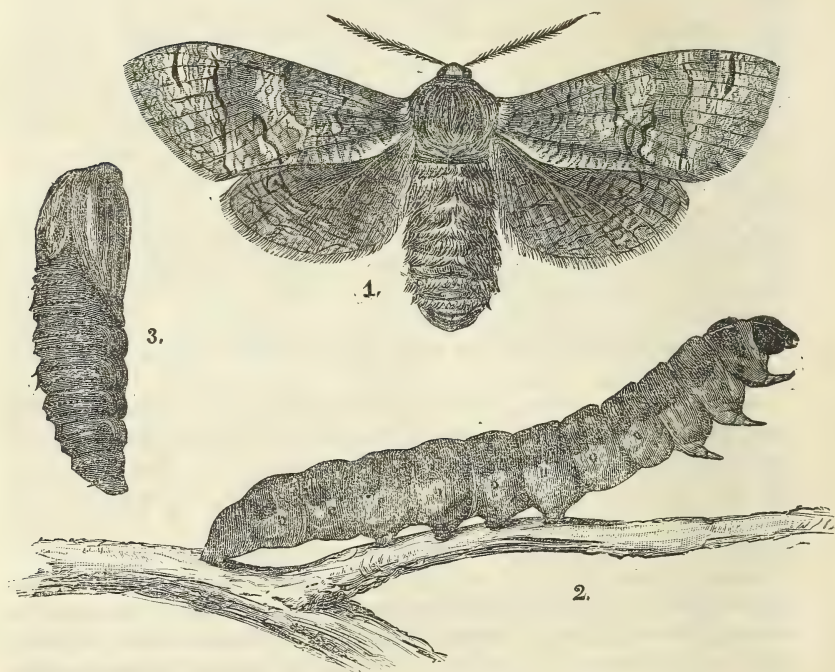
Apple trees, whose stems and branches are infested with woolly aphides, should have their roots examined for possible infestation. This is indicated by swellings upon the roots and by the white, woolly groups of insects. The earth should be taken off the main roots, which, in many kinds of apple trees, spread far underground, and from all round the base of the trunks, so that the thick soft-soap and paraffin composition may be brushed well over these parts. Lime-wash may be put on advantageously; or a composition of soft-soap and carbolic acid at the rate of 1 gallon of carbolic acid to 2 lbs. of soft-soap, put into 16 gallons of water, may be brushed in or syringed over the roots. Water must be added according to requirements. It is desirable that the compositions should be of considerable consistency if merely brushed on.

Pigs penned in orchards close round infested trees would make the roots and surroundings most unpleasant for the subterranean invaders. Watering infested roots with strong liquid manure would be efficacious. In Australia, varieties of apples worked upon stocks of the Northern Spy, an American variety of apple, and the Majetin, a Norfolk (England) variety, are said to be proof against the action of the woolly aphid. According

to Mr. French, the Government Entomologist of Victoria, another variety, "Perfection Paradise," has been lately raised superior to the Northern Spy and Majetin. In Queensland, there are several other varieties more or less proof against this insect. The reason of this immunity seems to be that the skin or cortex of these varieties by its hardness and close arrangement of tissues is able to resist the action of the aphides.

Several species of the *Coccinellidæ* and of the *Syrphidæ* are most beneficial in devouring quantities of these destructive aphides. The *Schizoneura lanigera* is devoured in immense numbers in Australia by a little yellow and black species of the *Coccinellidæ*, styled *Leis conformis*.

THE GOAT MOTH (*Cossus Ligniperda*).



1. Moth. 2. Larva. 3. Pupa. Nat. size.

Many reports have come to hand during the past three years of injuries caused to trees of various kinds by the caterpillars of the large moth commonly known throughout Great Britain and Ireland as the "Goat Moth," and it appears that from some cause or other the insect has considerably increased of late. Trees of all species in forests, woods, plantations, shrubberies, gardens, streets, and orchards have been attacked, and it is difficult to say what species of tree is most liable to be selected by the moth. It attacks the oak, ash, elm, birch, beech, alder,

chestnut, willow, poplar, and some authorities say the larch and Scotch fir; but the elm, poplar, and willow are its favourite resorts, because their wood is comparatively soft and has much pith. Oaks, however, are often infested and seriously damaged by the action of the Goat Moth caterpillars, which are able with their powerful jaws to bore into the closest grained wood. Fruit trees, such as apples, pears, plum, damson, cherry, and walnut trees, are often materially injured by them.

From 70 to 300 of these caterpillars have been found in a single tree, and in these circumstances the tree soon decays and dies. Besides the direct harm occasioned by the caterpillars, the wet gets in through the holes made by them, causing the wood to rot; and wood-lice and other insects are harboured in the decaying substance. An apple tree, which was evidently dying, was recently examined, and many holes were found in the trunk and branches. When it was cut down nearly 90 caterpillars were taken from it. Elm trees, as mentioned above, being naturally brittle, suffer much from this insect, the tunnellings of the caterpillars often cause the limbs to snap off in windy weather. In the Bois de Boulogne, near Paris, some years ago, the elms were greatly injured by the caterpillars of this moth, and lately in Brussels and other cities of Belgium, the elms by the sides of the streets have suffered considerably from this pest.

The Goat Moth is found in most European countries. An insect of almost identical habits, known as the "Oak Carpenter worm" (*Prionoxystus robiniae*), is most destructive to some trees in America.

Life History.

The Goat Moth belongs to the family *Zeuzeridae* of the group *Bombycina*, being one of the largest and most handsome of the British Moths. It measures from $2\frac{3}{4}$ to 3 inches across the wings, and is $1\frac{1}{4}$ inches in length of body. The female is rather larger than the male, and in some specimens the female is rather darker in colour.

The head of the moth is reddish brown, and the antennæ are most distinctly pectinated in both sexes, but in the female the pectinations are shorter than in the male. The thorax is rusty brown, the abdomen is grey with tufts of whitish scales transversely arranged upon the segments. The fore-wings are ashy grey with delicate white and brown waterings, while the hind-wings are rather darker, becoming lighter towards the hinder margin, and having transverse brownish markings. The legs are dark coloured.

Appearing in June and July, the moth may be discovered on palings, posts, and the trunks of trees with its wings folded close round its body, though by reason of its brownish grey colour it is difficult to distinguish it. As it is a night flyer, it can rarely be seen on the wing.

Eggs are placed by the female by means of its ovipositor in small groups in the cracks in the bark of the trees. A female will lay from 400 to even 1,000 eggs, so that it is fortunate that this moth is not particularly abundant. Its egg is broadly oval in shape, dusky in colour, and about the size of a clover seed. Some persons hold the idea that the moth lays eggs by preference upon trees that are in an unhealthy state or decaying; but this is erroneous, for it has been proved that the soundest trees are attacked.

In about seven or eight days, the larva comes from the egg, and at first feeds upon the rind and inner bark. As it gets older, it works its way further inwards. It tunnels in a longitudinal direction. The inside of the tunnel, or mine, is generally covered with a black layer composed probably of *excreta* and wood dust. In its earlier stages, the larva is pinkish in colour, gradually becoming darker until when fully developed it is almost mulberry coloured on the back with a shade of pink on its sides, and a yellowish shade below the spiracles. There are a few long fine hairs upon its body. The head is flat and black; on the second segment there is a large horny plate. It has very powerful jaws, adapted specially for biting hard substances; and six pectoral legs, brown in colour, and eight light pink prolegs furnished with hooks, and two anal feet.

The caterpillar lives for three years. At the end of this period it approaches the hole or exit of the tunnel, and at some distance from it forms a cocoon of silk and morsels of wood in which the pupal state is assumed. A caterpillar which was put in a paper glass-topped case, instead of gnawing its way out, was found coiled in a ring in a corner and covered with silk and paper bitten off the sides of the case.

The pupa is about an inch and a quarter long, of cylindrical shape, reddish-brown in colour above, but rather lighter below. The segments are furnished with rows of teeth. By means of these, the pupa when it is changing moves itself to the mouth of the tunnel and the perfect insect escapes. Occasionally, caterpillars leave the trees and are seen crawling on the ground, or are found in cocoons of silk and dirt in the earth.

Prevention and Remedies.

When infestation is ascertained by the exudation of sap from places in the tree, the collection of "frass" at the mouths of the holes, or tunnels, or the protrusion of empty cocoons from them, a sharp look out should be kept for the moths. They are dull, and heavy in flight, and rest during the day on trees, palings, &c.; and may be discovered by persons with good eyes, and should be ruthlessly destroyed. Latreille advises that the lower parts of the stems of trees in infested localities should be smeared with a mixture of lime-wash and cow-dung to prevent the females from laying eggs there. According to a receipt given

by Drs. Judich and Nitsche in their "*Lehrbuch der Mitteleuropäischen Forstinsekten-Kunde*," tobacco juice, obtained by boiling tobacco in water, and bullocks' blood are added to the lime and cow dung. This and other dressings, however, should be applied high up the trees as eggs have been found from 8 to 10 feet from the ground, but except, perhaps, in the case of orchards, this mode of prevention would, it is thought, be too expensive.

In Belgium, where this insect recently caused serious harm to elms, the bark and frass were scraped from the mouths of the caterpillars' tunnels, and the openings were enlarged somewhat with a sharp knife. Insecticides or insectifuges were then forced up through the tunnels by means of a strong syringe with a long curved nozzle. The results of this operation were quite satisfactory, as it is stated that neither moths nor eggs were seen upon the trees in the rows treated in this way. A composition of petroleum was also tried, but this was not so effectual. Besides, petroleum solution is likely to injure the trees if it is too strong.

Thrusting wire up the tunnels in some instances kills the caterpillars. If a hook is formed at the end of the wire caterpillars can sometimes be drawn down the tunnels.

When holes made by these caterpillars are seen in trees they should be at once plugged up with wooden pegs well driven in, or with cement, to prevent the wet getting in, which would cause decay.

Birds are very fond of the large eggs of this moth. The Marsh Tit (*Parus palustris*) and the Blue Tit (*Parus cæruleus*) are very useful in this direction, as well as two or three species of "Wood-warblers" (*Phylloscopus*), which are diligent insect hunters.

HORTICULTURAL LEGISLATION IN BRITISH COLUMBIA.

A supplement to the *British Columbia Gazette*, a copy of which has been transmitted to the Board of Agriculture by the Agricultural Department of that Colony, contains certain regulations regarding the destruction of insect pests, made under the Provincial Horticultural Board Act of 1894.

It is notified in these regulations that the word "pests" includes woolly aphis, apple-tree aphis, scaly-bark louse, oyster-shell bark louse, San José scale, red scale, borers, codlin moths, currant worms, or other known injurious insects, and all fungous diseases.

The regulations provide that all nurserymen, fruit growers, and persons owning, occupying, or managing an orchard, garden, or nursery infested with any pest shall notify to the member of the Horticultural Board for the district in which such orchard, garden, or nursery is located, or the secretary or inspector, or

the agent of the Horticultural Board in the district, the fact that such orchard, garden, or nursery is so infested.

All dealers, nurserymen, or persons importing, selling, or distributing nursery stock, trees, or plants, for which no clean certificate is in force, must, before distributing or offering for sale any article above mentioned, acquaint the member of the Board, his agent or representative in whose district any such article is found, or the secretary of the Board, or the inspector of fruit pests, who shall inspect or cause to be inspected such nursery stock, trees, or plants, and if they are found to be free from pests shall issue a certificate to the owner or person in charge, stating that the said articles appear to be free from pests. Such certificate shall be in force for three months from the date of issue, unless revoked by further inspection.

All persons owning or having in their possession nursery stock, trees or plants of any kind, infested with insect pests or fungous disease, must cause the same to be disinfected and cleansed by using the remedies prescribed in the regulations, or such other insecticides and fungicides as may be found effective, and are approved by a member of the Board or the inspector of fruit pests, and no such infested nursery stock, trees, or plants must be sold, forwarded, distributed, or parted with until a certificate of the satisfactory cleansing thereof shall have been obtained from a member of the Board, or his agent, or the inspector of fruit pests.

All importers of fruit must give notice to a member of the Board of Horticulture, or his agent, or the Inspector of Fruit Pests, upon the arrival of any shipment of fruit; and all fruit or fruit packages imported into the province are to be inspected, and if found to be free from insect pests and fungous disease a clean certificate shall be issued in conformity with the rules and regulations of the Provincial Board of Horticulture; provided, however, that no fruit or fruit packages imported into the province are to be removed from any dock, wharf, mole, or station where such fruit and fruit packages have been landed before inspection and such clean certificate thereof shall have been obtained, and all such fruit and fruit packages as may be found infested with any insect pest or fungous disease are either to be destroyed by the importers thereof by such process as any member of the Board, the Inspector of Fruit Pests, or any agent appointed by the Board may direct, or shall be re-shipped by the importers thereof to the country from whence such infested fruit was exported.

All fruit, whether imported or grown in the province, or exposed for sale, is subject to inspection under the authority of the Horticultural Board, and if found to be infected with any injurious pest or the larva thereof, it may be quarantined or destroyed at the expense of the owner of said fruit by such methods as the Board or its agents may direct.

All persons shipping, sending, or delivering any fruit, fruit trees, scions, cuttings, or plants within the province, must place

upon or securely attach to each box, crate, or other package or parcel containing the same a distinct stamp, mark, or label showing the name of the producer and shipper, or sender, and the locality where grown.

All infected nursery stock, before being distributed, must be disinfected by dipping in a solution of one pound caustic soda (concentrated lye) and one pound whale-oil soap to every five imperial gallons of water, thoroughly dissolved, and applied at 103° Fahrenheit in a vat or any suitable vessel, or the said nursery stock may be disinfected by covering with an air-tight tent or box, and for each and every 100 cubic feet of space therein one ounce of fused cyanide of potassium (58 per cent.), one fluid ounce of sulphuric acid, and two fluid ounces of water shall be used. The cyanide of potassium shall be placed in an earthenware vessel, the water poured over the said cyanide of potassium, afterwards adding sulphuric acid, and the tent or box to be immediately closed tightly and allowed to remain closed for not less than 40 minutes. Treatment for disinfection shall continue until all insect pests and their larvæ are destroyed.

The regulations provide further that where pests or fungous diseases are found to exist during the growing season, while the trees are in leaf, spraying must be done, and such remedies applied as shall be recommended by or under authority of the Horticultural Board from time to time, so that the insects or diseases can at least be held in check until the stronger washes of the dormant season can be safely applied.

All boxes, crates, or other packages or wrappings which have contained infested nursery stock must be destroyed by fire immediately after the removal of the contents thereof. Where hop-fields are infested with the hop-louse, spraying must be done as the Horticultural Board from time to time shall recommend.

Every person violating the provisions of the "Horticultural Board Act, 1894," or the rules and regulations adopted by the Provincial Board of Horticulture, is liable, upon summary conviction before a justice of the peace, to a penalty not exceeding 50 dollars for each offence.

Horticultural and agricultural societies and all those interested in advancing and protecting the interests of fruit-growing are requested to co-operate with the Provincial Board of Horticulture in the enforcement of the provisions of the "Horticultural Act," and the regulations thereunder as adopted by the Board.

THE CABBAGE-ROOT MAGGOT IN AMERICA.

In the *Report on Insects and Fungi Injurious to Crops* issued by the Board of Agriculture in 1892 a detailed account of the cabbage-root maggot was given, describing the insect, with methods of prevention and remedies. Mr. Slingerland, Entomological Assistant at the Cornell University Agricultural

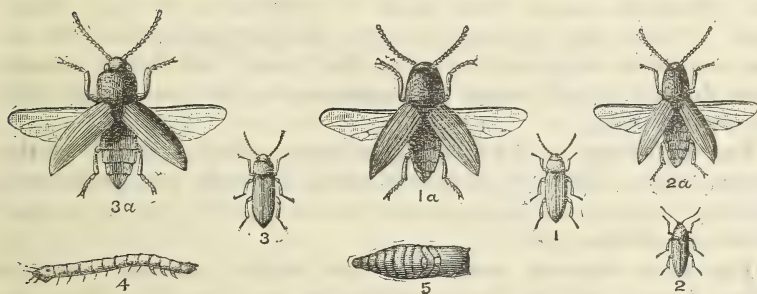
Experiment Station, has just published a most elaborate bulletin upon this cabbage-root maggot, and the results of a series of experiments "with a view to finding some effective preventive or destructive method of combating it." This pest was so troublesome in Long Island that many gardeners had given up trying to grow early cauliflowers and cabbages solely on account of its ravages. Some new and interesting discoveries in respect of this insect have been made by Mr. Slingerland. Among these is the fact that the cabbage-root maggot in the United States not only feeds upon cabbages, cauliflowers, radishes, turnips, swedes, and stocks (*Matthiola*), as in Europe, but it also feeds on the common winter cress (*Barbarea vulgaris*) and the hedge mustard (*Sisymbrium officinale*). Mr. Slingerland has found the maggots on the roots of these plants, and is of opinion that they probably infest other cruciferous weeds. He writes: "If all the cruciferous weeds could be exterminated and none of its other cultivated food plants be grown unprotected near by, then a few years of prevention with the cards would doubtless starve out the pest in that locality." This "prevention with the cards" means encircling each cabbage or cauliflower plant directly it is transplanted with tarred paper collars resting close upon the ground. These tarred cards, or paper collars, are cut with six sides, and are about 3 inches long by 3 inches broad. A slit runs to the centre, in which a "star-like cut" is made. To put the card in place it is bent slightly, the slit is opened, and the stem put in and slipped to the centre; the card is spread down flat, and the points left by the "star-like cut" are pressed around the stem. The tarred paper prevents the flies from egg laying on the stem.

Spraying plants with carbolic acid emulsion appears to have been efficacious in preventing egg laying. This is made with 1 lb. of soft-soap and a half gallon of crude carbolic acid mixed with 1 gallon of water, and then diluted with from 50 to 75 parts of water. Mr. Slingerland says that spraying with a stronger carbolic acid emulsion will, he believes, "kill eggs and recently hatched maggots."

Carbon bisulphide injected close to infested roots has proved of great value. This is put into the ground round the plants by means of a clever instrument known as the McGowen injector, very much less clumsy than the "Pal injector" used for injecting carbon bisulphide in the French vineyards, though its principle is similar. The reservoir of this will hold 2 quarts of the carbon bisulphide, which is sufficient to treat about 500 cabbage plants. The cost of the injector is from 12s. to 25s. Carbon bisulphide costs about 6d. per lb. in America, and about a teaspoonful is required for each plant, costing about $\frac{1}{2}$ d. Mr. Slingerland believes "it is the best, cheapest, and most effectual and most practicable method yet devised for fighting this pest on crops of cabbages and cauliflowers; on crops of radishes, turnips, or onions it will probably be too expensive."

Mr. Slingerland has come to the conclusion, after careful study, that this fly should not be called *Anthomyia brassicae*, but *Phorbia brassicae*, Bouché, though he realises the responsibility incurred by the wide divergence from the opinions of systematists which his appellation represents. He states that for 50 years past, so far as he can discover, every economic writer, whether American or European, has called the cabbage maggot *Anthomyia brassicae*, Bouché. But he has found only two or three references to Bouché's species in the systematic literature of the Anthomyians. Westwood, Osten-Sacken, and Leunis apparently accepted *brassicae*, Bouché, without question. Our great dipterist, Mr. Meade, writing to Mr. Slingerland, says that the true cabbage fly is *Phorbia floccosa* of Macquart, and that this species has been confounded with *Anthomyia radicum*, Linn. But Mr. Slingerland maintains his opinion still, and from an examination of the evidence he adduces he seems to have much reason for this.

WIREWORMS.



- | | |
|--|-------------------------------|
| 1 and 1a, <i>Agriotes lineatus</i> . | } Natural size and magnified. |
| 2 and 2a, <i>Agriotes sputator</i> . | |
| 3 and 3a, <i>Agriotes obscurus</i> . | |
| 4. Larva of <i>Agriotes lineatus</i> . | } Natural size. |
| 5. Pupa. | |

Wireworms are the larvæ of the genera of beetles known as *Elater*, *Athous*, and *Agriotes*, belonging to the large family of *Elateridæ*. But those which do the most harm to cultivated crops are species of the genus *Agriotes*, namely, *Agriotes lineatus*, *Agriotes sputator*, and *Agriotes obscurus*. The chief culprit of these, without any doubt, is *Agriotes lineatus*.

It is scarcely necessary to recapitulate the crops that are attacked by wireworms, and it will suffice to state that hardly any crop is free from their ravages. Corn of all kinds, roots of all kinds, and vegetables of all kinds, suffer in turn; and hop and strawberry plants often receive serious injuries from these insects. Curtis says, in "Farm Insects," that wireworms will not touch mustard, and recommends that mustard should be

grown in fields infested with wireworms, in order to starve them out. Recent experiments, however, made in America at the Cornell University Agricultural Experiment Station by Messrs. Comstock and Slingerland, do not indicate that a crop of mustard will render the soil so free from wireworms that the succeeding crop will escape their ravages. Hop plants are frequently very seriously injured by wireworms. When they have got into the fibrous roots of these plants it is impossible to get at them, and they bite off the shoots as fast as they make their appearance, and eat the softer parts of the roots. In some old hop grounds they have been most troublesome in this way. It was considered that the backwardness of the bine, and the small "spindly" size of the bine that came from the hills or plant centres, were due to natural weakness or age, but examination showed that wireworms were the cause of the trouble.

In newly planted hop grounds, wireworms are often most destructive, eating off every shoot, checking growth, and sometimes killing the stock outright.

Wireworms are more to be dreaded than most other insects, because they feed upon stems and roots at all times and seasons of the year, except during very hard frosts, when they go down deep into the earth. As they live from three to five years in the wireworm stage, their work of mischief is of long duration. Curtis says, on the authority of Bjerkander, that life in the wireworm stage continues for five years; but this of course must depend greatly upon circumstances as to food supply and other conditions.

The wireworm is the larva of a beetle called "click" beetle, because when held by one end it bends its body and produces a clicking sound, and when placed on its back it jumps up and makes a peculiar click.

The most common species of the beetle, *Agriotes lineatus* (Figs. 1 and 1a), is three-eighths of an inch long, and its wing expanse is slightly over half an inch. Its thorax is tawny; the wing cases are brown, with lines of yellowish brown. The antennæ are reddish yellow, and the legs brown.

Agriotes sputator (Figs. 2 and 2a) is not so large as *Agriotes lineatus*. It varies in colour from brownish black to chestnut, and has grey down upon it, with yellow antennæ and brownish yellow legs.

Agriotes obscurus (Figs. 3 and 3a) is rather larger than *Agriotes lineatus*, tawny to brown in colour, with dark thorax and reddish legs.

These beetles are found under stones, at the roots of grasses, upon grasses and various flowers and trees, in hedges and fields, and upon reeds. They fly well, and lay eggs either on grasses, corn plants, and weeds, or in the earth. Taschenberg says that the beetles live all the winter in places of shelter and concealment, and that pairing takes place in the first warm days of spring. The larvæ from the eggs live in the earth, near the roots of plants on which they feed.

The larva, or wireworm, of *Agriotes lineatus* (Fig. 4) is from six to seven-eighths of an inch long, very shiny, and of yellow colour, becoming more chestnut coloured when dead. It has a few hairs on its body, and three pairs of four-jointed legs on the first three segments, and a sucker foot on the terminal segment. It has very strong mandibles or jaws meeting over the mouth, well adapted for biting roots and fibres. With these jaws it quickly tears away the soft parts of the slightly bulbous stems of wheat, oat, and barley plants just above the roots, and kills the plants; it also bites off the sprouting vines in hop hills, and the slender roots of young turnips, mangels, carrots, and parsnips.

After a long period of life, varying from three to five years, according to circumstances, the larva goes down deep into the earth, makes a little oval cocoon of particles of soil, and changes to a pupa (Fig. 5), from which the beetle emerges in two or three weeks.

The larva of *Agriotes sputator*, said by Taschenberg to be especially fond of salad plants, is smaller than that of *Agriotes lineatus*, but similar in shape and general appearance, and the larva of *Agriotes obscurus* is much like that of *Agriotes lineatus* in shape, size, and colour.

Methods of Prevention and Remedies.

From the experiments at Cornell University Station, alluded to above, Messrs. Comstock and Slingerland conclude that it is almost impossible to extirpate wireworms by any of the means there adopted. These experiments embraced an endeavour to protect seeds, which are so liable to attack just after germination, by coatings of Paris green, tar, &c., and by soaking them in solutions of salt, chloride of lime, copperas, kerosene, turpentine and strychnine. These processes were found to have no effect in preventing the attack or killing the wireworms.

As regards the suggestion that wireworms may be starved out by fallowing land, or by cultivating crops distasteful to them, the Cornell experiments were equally unpromising. Messrs. Comstock and Slingerland advise farmers not to lose the use of the land for a season, and the labour necessary to keep it free from vegetation, in the hope that they may starve out the wireworms. The sowing of buckwheat, mustard, and rape, supposed to be the special aversion of wireworms, was also tried without any satisfactory results whatever.

In the same series of experiments, kerosene oil solution made of one part of oil to 20 parts of water, was sprayed on soil in a cage containing 25 wireworms. The solution was made to penetrate the soil by frequent sprayings. Though this process was effective to some extent, it could not be profitably applied on a large scale. The cost would be great, as 1,000 gallons of oil would be required per acre, and this would have to be driven into the soil by frequent sprayings.

Bi-sulphide of carbon, as used against the phylloxera, killed wireworms, but it would require 1,000 lbs. of the liquid per acre, so that it would only be practicable and profitable to employ this on limited areas and for valuable crops.

In extremely bad and persistent wireworm infestations of hop land, it might be desirable to try bi-sulphide of carbon, but, owing to its explosive nature, it must be very carefully handled. This could be applied close to the "hills" or plant centres, with the instrument known as the *pal Gastine*, resembling a large auger, or borer, which is worked into the earth close to the vine stocks. In the upper part of this instrument there is a cylindrical case to contain the bi-sulphide of carbon. Upon pressing a spring into this cylinder an exact dose of the insecticide is injected into the hole made by the borer. In the vineyards where this process is employed, the dose varies from one quarter to half an ounce of bi-sulphide of carbon injected in two or three places near each vine-stock.

In order to destroy wireworms with salt, it would seem that it must be applied at the rate of 10 tons per acre, and this would be practically destructive to vegetation. Lime applied at the rate of 200 bushels per acre, and gas lime at the rate of 20,000 lbs. per acre, did not extirpate wireworms in the Cornell experiments referred to above.

Although "traps" were tried at Cornell without very conclusive results, it is to be noted that "traps" of rape cake, mangel-wurzel, potato, carrot, and turnip have been found of great value in hop land, for instance, where almost the only way to get rid of wireworms is by placing pieces of these roots, or of rape cake, close round the hills or plant-centres.

These traps of mangel, potato, or rape cake should be placed close to the hills or plant-centres, about four or five inches below the surface, and examined once or twice a week, and the wireworms taken out and destroyed. The traps should be continued during the spring and summer, and up to the winter, in badly infested hop land, as the wireworms only go down deep into the ground when frost comes, and the traps will be more likely to be attractive when the hop plants are not putting forth shoots.

As it is rather difficult to find the "traps," white wooden skewers with points and thick heads might be advantageously used in the case of mangel, potato, turnip, and carrot traps, to show where they are, and to enable them to be pulled easily from the earth.

There is no doubt that wireworms have been encouraged in hop land by the quantities of rape "dust," or ground rape cake, put on for manure, so that in infested fields it would be well not to use rape cake as a manure for some time.

Rape dust sown broadcast on wheat, oats, barley, and other crops infested with wireworms, at the rate of from 5 to 7 cwt. per acre, has frequently been the means of saving the crop, as

the wireworms are attracted by the smell of the rape and feed upon it in preference to the corn crops, while these grow away from their attacks in the meantime.

When old pasture is converted to hop land it would be well to burn the turf, in order to destroy the wireworms. Ploughing it in deeply will be of no avail whatever; and liming or gas liming, unless it is done on a very liberal scale, will not be of much use.

Land known to be infested should not be kept down to seeds for more than one year, and after the first cut, sheep should be heavily folded on the land and the herbage kept closely fed off. When ploughed for wheat, the land should be pressed in order to make a firm seed bed.

In turnips, mangels, and grass the presence of wireworms is often not so apparent, and may remain undetected. A winter fallow is desirable after a bad attack in wheat, oat, and barley crops, in which damage is plain and manifest. In this case the land should be cultivated immediately after harvest and moved constantly, so that nothing may grow. Early in the spring the ground should be stirred again and vetches sown, of which wireworms do not seem to be very fond.

Good, clean, and deep cultivation checks the spread of wireworms. In Vol. XIV., 1st series, of the Journal of the Royal Agricultural Society of England in the course of an essay on the farming of light land, which is always more liable to the attacks of wireworms than heavy soils, a case is quoted of a farm in the neighbourhood of Guildford, kept perfectly clean by deep ploughing and unsparing use of horse and hand hoes, where the root and corn crops are stated to have been unmolested by wireworms; the owner asserting that he starved them out by growing no weeds to sustain them in the absence of a crop.

For wheat plants attacked by wireworms, it is desirable to roll the land, as early as possible in the spring, with a ring roller, after putting on 30 or 40 bushels of soot per acre, or a mixture of lime and soot in the proportion of one bushel of lime to two of soot.

A dressing of from one to one and a half cwt. of nitrate of soda per acre would stimulate growth and force the plants away from the wireworms; or guano or sulphate of ammonia might be used; or any other manure quick in action. Rolling with plain and ring rollers should be repeated, if necessary. Driving sheep over the wheat plants has been found serviceable. Neither this nor rolling kills the wireworms, as some think, but by pressing the earth round the wheat plants, either process may at least tend to keep the insects from the roots, for a time.

When oats and barley are attacked, dressing with soot and rolling should be tried, or nitrate of soda to stimulate the plants. Five to seven hundredweights of rape cake should be sown broadcast when the infestation is very severe, to entice the wireworm from the corn plants. It should be harrowed in if possible.

If it is suspected that wireworms are abundant in land sown with grass seeds, some rape cake, should be sown with the seeds to attract the wireworms until the grasses are established.

In meadow land infested with wireworms rolling with a very heavy roller is sometimes beneficial. Salt at from 5 to 7 cwts. per acre is sometimes useful, and folding sheep with mangels or swedes carted on to the grass land is a most valuable remedy.

Rooks, starlings, and plovers are eager devourers of wireworms, and the two last-named birds should be encouraged in every way. It has often been noticed that crops on land near the haunts of plovers, or peewits, as they are generally termed, are rarely injured seriously by wireworms.

X.—GENERAL AGRICULTURAL NOTES.

THE EFFECT OF WHEAT EXPORTS ON FOOD SUPPLY IN INDIA.

In a Report on the Operations of the Department of Land Records and Agriculture of the North-Western Provinces and Oudh, Mr. J. O. Miller, the Director of the Department, states, with reference to an inquiry by the Indian Government as to whether the export of wheat was leading to a change in the staple food of the people, that the investigations made on the subject have proceeded sufficiently far to show how difficult it will be to get any positive information, and how contradictory are the opinions held by the people themselves as to the effect of export. The statistics of trade of the three years ending 1892-93, however, show conclusively, in his opinion, that the great export of wheat in 1891-92 did not constitute a serious drain on the food supplies of the people, and that there is no reason to suppose that they were induced by the prospect of pecuniary profit to diminish their supplies unduly. In 1890-91, the net exports of wheat were unusually low—only 14,000 tons. In 1891-92, they were unusually high—357,000 tons; but the exceptionally large difference between these figures, 343,000 tons, is much less than the difference between a good and a bad harvest. In 1890, the outturn of the wheat harvest was estimated at 1,458,000 tons, and in 1891 at 1,745,000 tons. The difference of the estimates, 287,000 tons, is not quite so large as the difference between the net exports of wheat in the two years, but the outturn of the 1891 harvest was probably under-estimated, and the poor harvest of 1890 followed a still poorer one in 1889. The largest estimate made in recent years of the outturn of the wheat crop was 2,096,000 tons in 1885, the lowest was 1,440,000 tons in 1889; the difference between these estimates, viz., 656,000 tons, far exceeds the exceptionally large difference between the export trade of 1890-91 and that of 1892-93. The effect of the greatest expansion of export yet known is therefore small compared with the difference between a good and a bad season.

If figures were required to show that the export of wheat necessitated the import of other grains to make up for the drain on food supplies, it would be necessary to have recourse to the statistics of 1890-91, when wheat exports were at their lowest. In that year, the net import of rice and other grains was 177,000 tons; in the next year, when the exports of wheat had so largely increased, the net imports of other grains were only 2,000 tons; and in 1892-93, though the export of wheat continued on a large scale, the Provinces were able, owing to good harvests, to export rice, millets, pulses, and other food grains in far larger quantities than before, and to import less. The

export of these grains in that year exceeded the import by 230,111 tons.

Mr. Miller maintains that it is unnecessary to discuss what the possible effect of a great development of the export trade might be in theory, since the figures given negative any supposition that the people had been induced by the high price obtainable for wheat to send it out of the country when it should have been retained for their own consumption. They have merely exported surplus produce that they could well spare.

It may also be noticed that, notwithstanding the high export of wheat in 1891-2, and 1892-3, the average exports in the seven years ending 1892-3 were actually lower than in the five years preceding. From 1881-82 to 1885-86 inclusive, the average annual exports were 223,000 tons; from 1886-87 to 1892-93 they were only 190,000 tons. The Provinces, therefore, have been in recent years exporting less wheat and not more than they formerly did; and there is nothing in the history of recent years to give any ground for supposing that their trade organisation is so defective, and their traders so wanting in knowledge and foresight, as to encourage export of grain that ought to be retained for consumption in the country.

THE AGRICULTURAL POPULATION OF FRANCE.

The *Bulletin de Statistique et de Législation comparée*, which is published by the French Ministry of Finance, has recently given an analysis of the French Census of 1891, the full results of which were issued by the Ministry of Commerce in the month of August last.

It will be remembered that the census is a quinquennial one in France, and in 1891, as on former occasions, the enumeration forms were arranged so as to divide the whole population into eight separate professional groups. These groups were further subdivided to distinguish what is called the *active* population consisting of (1) employers (*patrons* or *chefs d'établissement*); (2) managers, foremen, bailiffs, and others (*employés*); and (3) labourers (*ouvriers* or *journaliers*); from the *inactive* population consisting of (1) those members of the families of the above, whether employers or employed, with no distinct profession of their own, and who were therefore taken to be dependent members of the family; and (2) servants employed by heads of these families.

At the last census, moreover, particulars were for the first time taken as regards age, so as to further classify the professional population of France into three categories, viz., the number of persons under twenty, those between twenty and sixty, and those above sixty years of age.

The following statement gives a summary of the total population of France in 1891 grouped by professions, and subdivided as regards social condition:—

Social Condition.	Agriculture.	Industry.	Rail way and Transport Service.	Commerce.	National Forces (Army and Navy, &c.).	Public Ad- ministration.	Liberal Professions.	Persons living entirely on their Private Means.	Total.
Employers	3,570,016	1,021,659	62,501	879,969	558,186	202,205	420,133	956,729	7,671,398
Managers, Foremen, Bailiffs, and others	75,400	207,222	138,707	378,318	781	7,626	78,024	13,021	899,099
Labourers	2,890,183	3,319,217	245,979	480,344	2,908	30,438	29,819	106,061	7,104,949
Active population	6,535,599	4,548,098	447,187	1,738,631	561,875	240,269	527,976	1,075,811	15,675,446
Families of the above	10,216,749	4,814,985	730,040	1,983,441	141,611	426,816	449,500	781,115	19,544,257
Servants	683,540	169,477	22,106	239,424	12,138	32,526	137,397	312,824	1,609,432
Inactive population	10,900,289	4,984,462	752,146	2,222,865	153,749	459,342	586,897	1,093,939	21,153,689
Total of the classified population	17,435,888	9,532,560	1,199,333	3,961,496	715,624	699,611	1,114,873	2,169,750	36,829,135
Non-classified population, including inmates of hospitals, boarders in schools and students, persons out of work, &c.									1,304,250
									38,133,385

TOTAL POPULATION

The number of males and females in each professional group, together with the proportion of the totals of these groups to the whole population in 1891, is shown in the next table :—

Profession.	Male.	Female.	Total.	Per cent. of the Population.
Agriculture - -	8,780,924	8,654,964	17,435,888	47·33
Industry - -	4,741,973	4,790,587	9,532,560	25·89
Railway and General transport service - -	660,441	538,892	1,199,333	3·26
Commerce - -	1,908,082	2,053,414	3,961,496	10·76
National forces (army navy, &c.) - -	606,275	109,349	715,624	1·94
Public administration - -	366,690	332,921	699,611	1·90
Liberal professions - -	498,339	616,534	1,114,873	3·03
Persons living entirely on their private means - }	837,624	1,332,126	2,169,750	5·89
Classified population -	18,400,348	18,428,787	36,829,135	100·00
Unclassified population - - - -	-	-	1,304,250	
Total - - - - -	-	-	38,133,385	

The proportional increase and decrease in the numbers of each group, as indicated by the results of the censuses which have been held in France since 1851, are shown to be as follows :—

Date of Census.	Agriculture.	Industry.	Commerce.	Liberal Professions ; + Persons living on their Private Means ; + Public Services.
1851	56·87	27·68		11·15
1856	52·94	29·07	4·53	9·06
1861	53·16	27·35	3·92	9·19
1866	51·49	28·79	3·99	9·48
1872	52·71	24·06	8·43	11·16
1876	53·04	25·93	10·73	10·30
1881	50·03	25·56	10·53	10·16
1886	47·82	25·17	11·50	11·09
1891	47·33	25·89	10·76	10·82

From the above figures, it will be observed that whilst no very marked fluctuation has obtained as regards the commercial and professional population, the agricultural section has maintained throughout the period a tendency to decrease, and more especially since the census of 1876.

A further method of classification is given in the next table to show the agricultural population divided into various sections,

from which it is observed that, in 1891, the number of land-owners farming their own land was about twice as great as the total number of persons farming land belonging to others :—

—	Em- ployers.	Managers, Foremen, Bailiffs, and others (<i>En- ployés</i>).	Labourers.	Families of the foregoing.	Domestic Servants of the foregoing.	Total of the Agri- cultural Popula- tion.
Landowners farming their own land - - - -	2,231,513	40,470	1,292,543	5,638,426	349,228	9,552,180
Tenant farmers, <i>métayers</i> , &c. - - - -	1,192,542	26,474	1,395,367	4,075,247	307,169	6,996,799
Horticulturists, market- gardeners, and nursery- men - - - -	94,338	7,147	130,735	293,616	22,274	548,110
Woodcutters and charcoal burners - - - -	51,623	1,309	71,538	209,460	4,869	338,790
Total - - - -	3,570,016	75,400	2,890,183	10,216,749	683,540	17,435,888

It would occupy too much space to reproduce the figures showing the proportion of the agricultural population to the total number of inhabitants of each department in France.

The Seine department, in which Paris is situated, is, as would be expected, at the bottom of the list, with an agricultural population of 1·6 per cent. The following are the names of the next departments in this connection, in ascending order:—Bouches-du-Rhone, 20·1 per cent.; Rhone, 21·6; Nord, 22·9; Seine Inférieure, 24·6; Ardennes, 29·0. Seventy-three departments contain an agricultural population whose proportion to their total number of inhabitants is between thirty and seventy per cent. The departments having a larger proportion than seventy per cent. are as follows:—Côtes-du-Nord, 71; Savoie, 71·3; Gers, 71·5; Hautes-Alpes, 72·2; Lozère, 72·5; Basses-Alpes, 72·7; Cantal, 74; and Lot, 77.

The mean proportion of the agricultural to the whole population is 45·72 per cent. If the 1,304,250 unclassified persons referred to in the first two tables be left out of consideration, the agricultural per-centage becomes 47·33, showing a reduction of 0·49 per cent. compared with the census of 1886.

EXPORT OF FROZEN MILK FROM DENMARK.

According to a statement published in the *Berlingske Tidende* of the 28th January, a company at Copenhagen has completed arrangements for the regular export of frozen milk to England. The necessary freezing plant has been erected at a cost of 2,500*l.*, and a contract has been made with the proprietors of a large dairy at Skanderborg for the delivery of 110,000 lbs. of milk weekly.

POULTRY BREEDING IN AUSTRALIAN.

In a leaflet issued recently by the Department of Agriculture of Victoria (Australia), entitled "Poultry Breeding and Management for the English Market," it is stated that it has been hitherto the practice to consider poultry-breeding a matter of minor importance to farmers in the Colony, but the result of inquiries and experiments conducted by the Department have shown that the industry is one which can give good profits and quick returns. By way of illustration, it is mentioned that at the time when experimental shipments were made, poultry was almost unsaleable at Melbourne, whereas the prices realised in London were from 2s. 9d. to 4s. for chickens, and 3s. 3d. to 5s. for young ducks.

It is pointed out that the difference between the Colonial and English seasons places Victoria in a position to be able to supply the London market at a time when prices are at their highest, so that when the Victorian poultry is ready for disposal it can be landed in an unlimited market and thus secure the best possible prices. The trial shipments made to London in the last season showed that poultry from Victoria will command a ready sale. Very short notice was given to breeders that the Department of Agriculture intended to supervise the shipments of dressed poultry, so that none of the birds sent were specially dressed or fattened, but consisted only of ordinary farm or market poultry.

Victoria is said to be exceptionally favoured by Nature with a most suitable climate for breeding and rearing poultry, which has hitherto been practically a neglected industry. Now that poultry can be shipped to the world's markets in a perfect state of preservation by means of the refrigerating chambers, there will be, in all probability, a larger extension of poultry farming in Victoria and other Australasian colonies.

Detailed instructions are given in the leaflet as to the best kinds of poultry to keep, the best modes of feeding, which tally in most respects with those adopted by the Sussex poultry rearers, as described in the December number of "The Journal of the Board of Agriculture." A novel feature is the use of turkey hens as incubators or hatching machines. These are said to be the best sitters and can be made to sit at any time, without being broody, by giving them a teaspoonful of port wine before placing them on the nest. They will each cover 20 eggs, and bring out three or four clutches before leaving the nest. The chickens are removed to foster mothers or ordinary hens, which have chickens of the same age, and a fresh sitting of eggs supplied to the turkey on the nest.

NEW ZEALAND APPLES.

According to the reports of the Government Pomologists, for 1893-4, submitted to the New Zealand Department of Agricul-

ture, New Zealand, in respect of soil, climate, and general conditions, is capable, equally with California, of producing the finest apples of almost all descriptions, and without the artificial aid, in the shape of the expensive service of irrigation, required by the last-named country. But the fruit growers in New Zealand have not, in the opinion of Mr. Palmer, the Pomologist of the North Island, the necessary knowledge of any proper system of cultivation and of the means to be taken for the destruction of insects and other pests. It appears that the planting of fruit trees has been carried on without any system whatever, and unsuitable situations and varieties unfitted for conditions of soil and climate have been selected. The Pomologist of the South Island, Mr. Blackmore, remarks, that he found fruit-culture much neglected in the various orchards he visited. The trees were overrun with scale insects and various forms of fungi. Mr. Blackmore adds that he has endeavoured to encourage orchardists to make shipments of apples and pears to the London market, but that owing to the high rate of freight and other charges, and the want of unity amongst growers, his efforts to promote shipments of fruit have in part failed. It seems that there is not really sufficient good fruit to compete in the various markets of the south with the superior produce of Tasmania, and Mr. Blackmore is of opinion that before the export of fruit from New Zealand can become permanent and profitable, the area of the orchards must be considerably extended by planting the varieties most suitable for export and the home market.

The New Zealand Agent in England reports that the very optimistic views of those who introduced Australian and New Zealand apples to London have by no means been verified, and that those who once thought that the Colonies had found a very valuable market for their green fruit have very largely modified their views. But some hope is expressed of a better prospect for the future if only the colonist takes proper advantage of the situation. The New Zealander appears to have believed that any kind of apples would fetch high prices in London, and consequently there has not been anything like the amount of care necessary in selecting proper varieties, or in packing them with due regard to the conditions of their transit and sale. Colonists are advised, therefore, in the Agent's report, not to send common fruit as there is plenty of this in the London markets, but to send only the very best, remembering that these apples are looked upon as luxuries for the well-to-do classes and not as articles of common consumption, for high prices will not be paid, even by the wealthy, for common fruit.

Taking the statements of the Pomologists and Agent together, it would seem that too large a proportion of common apples have been sent to London from New Zealand, and that from the state of the orchards and apple culture generally in that

country, competition from that source is not likely to be formidable, at all events, for some time.

HORSE-BREEDING IN AUSTRALIA.

A recent number of the official *Agricultural Gazette* of New South Wales contains a letter relating to horse-breeding in Australia, addressed by Major-General E. T. H. Hutton, C.B., commanding the military forces, to the Minister of Mines and Agriculture of the Colony.

General Hutton states that it is the opinion of many leading authorities, as well as of himself, that sufficient attention is not being paid in Australia to the breeding of horses for domestic purposes, and that the quality of such horses is in consequence gradually deteriorating. There can be no question, he adds, that a very important industry in New South Wales and in the other Australian Colonies is seriously threatened, and the export trade in horses, which should be a specialty of Australia, is likely to grow less and less every year, more especially as the Indian Government are now beginning to breed large numbers of horses for the use of the Indian army.

As regards other markets for the sale of Australian horses, General Hutton refers to the great and increasing trade in horses for military purposes which now obtains in Europe, and observes that, if horse-breeders will give the matter attention, the class of horses existing in Australia should not only become a source of wealth to Australia, but should also directly benefit the country by encouraging a pastoral industry of great value.

The facilities of shipment to Europe yearly become greater and simpler, so that horse-breeders in Australia should, it is maintained, be able to command the European horse-market in preference to South America, North America, Syria, and North Africa. The horses of the two former countries have not, it appears, the blood or the fine qualities of the Australian horse at his best, while the horses of Syria and North Africa are small and too slow for military purposes, or even for general domestic use.

General Hutton suggests that the New South Wales Government, in concurrence with the other Australian Governments, should put a tax on stallions so as to restrict the breeding from weakly useless sires, and that the Indian Government and the Imperial Government should be approached with the view to the establishment of a Remount Purchasing Agency in New South Wales, to be presided over by a carefully selected Imperial officer of experience. Such an agency would, it is thought, at once create a market, and establish the requisite standard which Australian breeders should endeavour to reach in order to command the military horse-market of Europe. This system would speedily develop the European horse trade throughout Australia, the

importance of which may be gathered from the estimate that over 30,000 horses of all kinds are yearly required by the armies of Great Britain, France, Germany, and Austria, namely:—France, 14,100; Germany, 9,370; Austria, 5,840; Great Britain (exclusive of India), 1,470.

The *Gazette* quotes the following official statistics to show the extent of the trade in horses from Australia to India.

From New South Wales there were exported in 1889, 190 horses valued at 1,900*l.*; in 1890, 861 valued at 11,581*l.*; in 1891, 440 valued at 8,800*l.*; in 1892, 865 valued at 19,490*l.*; and in 1893, 213 valued at 5,320*l.*

From Victoria there were exported between 1889 and 1893, 16,800 horses valued at 402,500*l.*

From South Australia, between 1890–93, there were exported 966 horses valued at 19,320*l.*

From Queensland 257 horses, valued at 2,570*l.*, were exported in 1890; in 1891, nil; in 1892, 240 valued at 1,542*l.*; and in 1893, 961 horses valued at 9,380*l.* were exported.

DEMAND FOR PLOUGHS IN MADRAS.

The Board of Agriculture have received a copy of the recently published Report on the operations of the Department of Land, Records and Agriculture of the Madras Presidency for the year 1893–94, from which the following extract is taken:—

“The chief feature of the year is the recrudescence of the demand for heavy iron ploughs in Bellary, where they are preferred for the purpose of breaking-up and reclaiming black cotton soil when overgrown by strong deep-rooted grasses. About 15 years ago, the Honourable Mr. A. Sabapathy Mudaliar, of Bellary, purchased from the Department a dozen heavy iron-ploughs belonging to the Department which had been sent out to this country after the Vienna Exhibition, where they attracted attention. These ploughs, which were of Swedish make, were remarkably cheap and well-made. He found them very useful, and soon after imported and sold locally a large number. The demand later on fell off, but during the past season it sprang up again with great vigour, and the available supply of ploughs fell far short of the demand. It appears probable that the demand will continue, and there is no doubt that these heavy iron ploughs, for which the ryots have been paying Rs. 60 or more, have become established in the country around Bellary. There is, however, much room in Bellary, and the adjoining districts of Anantapur, Cuddapur, Bellary, and Kurnool, for the use of a largely-increased number of these implements. An agricultural inspector, touring in the Bellary taluk, reported in May last that he found 89 iron-ploughs in nine villages, and an enterprising

blacksmith at Bellary appears to have got out a large consignment of these ploughs from Sweden."

EXPERIMENTAL FARMS IN CANADA.

The Statistical Year Book of Canada, recently issued by the Canadian Department of Agriculture, contains some information respecting the experimental farms of Canada. The establishment of such farms in the Dominion was authorised by an Act of Parliament in 1886. They are five in number, and contain in all about 3,100 acres of land. There is a central experimental farm located at the capital, Ottawa, and there are four branch farms in the other provinces, viz.:—at Nappa in Nova Scotia, at Brandon in Manitoba, at Indian Head in Assiniboia, and at Agassiz in British Columbia.

At these farms, many experiments are in progress in all the branches of agriculture, horticulture, and arboriculture, and many problems of great importance to farmers have already been solved. In selecting the sites for the farms, due regard has been had to the great variations in climate in different parts of the Dominion, and they have been so placed as to render efficient help to the farmers in the more thickly-settled districts.

The Central Farm has about 500 acres of land and a complete outfit of buildings with residences for the chief officers. There are buildings for cattle, horses, swine, and poultry. There is also a dairy with all modern appliances for experimental work; and a seed-testing and propagating house, with accommodation for the distribution of large quantities of promising seed-grain for test by farmers in different parts of the country. A chemical laboratory, thoroughly equipped with apparatus, has been established, and analyses are conducted of soils, fodder plants, grasses, roots, &c., and of natural fertilisers, such as muds, mucks, and marls from many parts of the Dominion. Waters for drinking purposes are also tested for purity, and many other useful lines of work bearing on agricultural pursuits are undertaken in this branch.

The chief officers are a director, with his headquarters at Ottawa, who supervises and directs the work on all the farms, and makes personal inspection of the branch farms at least once a year; an agriculturist, who conducts experiments with cattle and swine, and fills the important position of dairy commissioner for the Dominion; a horticulturist, who has charge of the extensive orchards and fruit plantations at Ottawa, and who carries on experimental work in the growing of fruits and vegetables and in the treatment of the various diseases to which they are subject; and a botanist and entomologist, who, with the aid of an assistant, investigate the subjects of injurious insects, noxious weeds, and plant diseases occurring

throughout Canada. In addition, there is a poultry manager, who takes charge of the poultry department; and a farm foreman, who directs the labour on the farm and takes general charge of the field crops. The production of new varieties of cereals and other crops, the ornamentation of the grounds, and the forestry plantations are departments in charge of the director and his assistant, the foreman of forestry. During the past five years, about 700 new varieties of cereals have been produced at the experimental farms by cross-fertilising and hybridising. Nearly 20 acres of land are occupied by forest-belts, composed mainly of useful timber trees, to test their relative value for timber purposes. About 600 varieties of trees and shrubs are being tested in the ornamental clumps and groups in different parts of the grounds. Experiments are also conducted in bee-keeping. With the aid of a suitable clerical staff, a large correspondence is carried on with farmers, who are encouraged to write to the officers of the farm for information and advice.

At the branch farms, much of the work is so arranged as to cover those questions which are of the most immediate importance to the farmers residing in the several provinces. Each farm is furnished with suitable buildings and supplied with the best breeds of dairy cattle and fat cattle. Useful experiments are conducted in feeding stock, also in raising swine and poultry. Many tests are made with the most promising varieties of grain, fodder-crops, roots, vegetables, forest trees, &c. Experiments are also conducted as to the best methods of preparing the soil for crops of various sorts, in the draining of land, in determining the best time for sowing, and the most practical methods of maintaining the fertility of the soil.

A large quantity of the best and the most productive varieties of grain grown on the several farms is distributed by mail, in small bags containing three pounds each, to farmers in all parts of the Dominion. These sample bags of grain, when sown and properly cared for, usually produce from one to three bushels, and at the end of the second year the crop will generally furnish the farmer with a sufficient quantity of seed to sow a considerable acreage. This distribution of seed is carried on at all the farms, but the larger quantity is sent out from the central farm. In 1893, 21,377 samples were mailed to 11,831 applicants. The surplus stock of promising varieties of grain grown at all the farms, beyond what is required for the sample bags, is sold to farmers in quantities of from one to two bushels to each applicant.

INTERNATIONAL EXHIBITION OF AGRICULTURAL MACHINERY
AT VIENNA, 1895.

The Board of Agriculture have received a communication from the Foreign Office, intimating that an International Exhibition of Agricultural Machinery will be held in Vienna, by the Imperial and Royal Agricultural Society from the 4th to the 7th May 1895. The Exhibition will be divided into the following sections :—

1. Machines and implements used in the operations of tillage, sowing, harvesting, threshing, &c., including also, field-railways, engines and motors, and pressing and stacking machinery.
2. Machines and implements used in malting, brewing, distilling, and in the manufacture of yeast, sugar, vinegar, and starch.
3. Machines and implements used in connexion with forestry, including field and forest railways for the conveyance of timber.
4. Machines and implements used in saw-mills and in the manufacture of wood-flock, pulp, and paper from wood.
5. Machines and implements used in the fruit and vine industries.
6. Machines and implements for the preparation of fodder, including fodder-steamers, troughs, and fittings for stables.
7. Machines and implements used in dairy-farming.
8. Implements for artificial fish-breeding.

In addition to the above, there will be a veterinary section, including illustrations of horse-shoeing, and a further section will be devoted to electricity, as used in agriculture, forestry, and dependent industries.

Space will be reserved for the exhibition of fertilisers and feeding-stuffs.

Machines and implements must be forwarded, carriage paid, to the Committee, who will give information regarding trustworthy forwarding agents, and the terms agreed upon with them by the Committee, and as to the abatement of rates on Austrian and other railways which it is hoped to obtain.

Intending exhibitors in any of the above sections should apply for forms of entry and copies of the Regulations to the Committee of the Exhibition at Herrengasse 13, Vienna I.

Applications for space made on the proper forms must reach the Committee before the 15th of March 1895.

EXPORTS OF MEAT AND DAIRY PRODUCE FROM MANITOBA
IN 1894.

In a Bulletin recently issued by the Department of Agriculture of Manitoba, it is stated that the export trade in cattle and hogs from that province gained special prominence during the year 1894. It is estimated that 11,000 cattle and 8,000 hogs were exported at an average price of $2\frac{1}{2}$ cents per lb. live weight for beef-cattle, and 4 cents per lb. live weight for hogs.

All the poultry disposed of by the farmers, viz., 46,183 turkeys, 16,334 geese, and 200,000 chickens, was consumed in the province. The supply was far short of the demand for home consumption, and large shipments of poultry were brought, as in previous years, from Ontario for the Winnipeg market.

The price of butter ranged from 10 cents to 20 cents a pound; 2,516,000 lbs. were sold in the province during the year, and the average price received was $15\frac{1}{5}$ cents.

At one creamery, during the first part of the season, 16 cents was paid for the cream necessary to make 1 lb. of butter; during the latter part of the season 15 cents was paid for the same. Payments were made in cash monthly.

Another creamery realised 20·18 cents per lb. for the output of the season: 85,000 lbs. Other creameries in the province give similar figures. By the introduction of creameries, much labour on farms is saved, and better returns realised in cash.

It is expected that the export of butter from Manitoba will be an important item in the near future. The necessity is pointed out, in the Bulletin, of starting the industry by establishing a high standard of quality, and maintaining it, so that markets once gained may be retained. The manufacture of butter in creameries is, it is stated, the only way of producing a uniform quality of high standard.

As regards the agricultural prospects in the province, it appears that the reports received from the regular correspondents of the Department have never before been so emphatic as to "hard times." From all parts of the province, correspondents say that it is impossible to pay the cost of machinery, and all the requisites necessary to farming operations, when prices of produce are so low.

Complaints are made against high tariffs, freight rates, interest, municipal taxes, and cost of supplies of all kinds, as well as harsh measures in collecting debts, with excessive costs on the same.

A few reports, however, say that careful expenditure and strict economy in every possible way, are beginning to show good results.

[AGRICULTURAL LABOUR IN ENGLAND IN JANUARY.]

In the monthly report of the agricultural correspondent of the Labour Department of the Board of Trade, published in the *Labour Gazette* of February, it is observed that in January 1895 the state of employment in agricultural districts was, generally speaking, of an unfavourable character, chiefly owing to the snow and the severity of the frost, which in many districts almost entirely prevented field work. But in some districts, the scarcity of employment was also partly due to the forward state of farm work up to Christmas. However, notwithstanding the severity of the weather, employment is said to have been not less satisfactory in the majority of cases than in the month of January 1894. It is pointed out that in comparing the state of employment, it must be borne in mind that there was a most disastrous harvest in 1893, and that consequently both the outdoor and indoor work in the winter of 1893-4 was seriously curtailed, while the harvest of 1894 was an abundant one, and notwithstanding the low price of agricultural produce, and the inferior quality of a considerable portion of the grain, farmers have had a good deal more work for their men at threshing, dressing, chaff-cutting, cleaning and pulping roots, delivering corn, feeding stock, and manure carting. Again, it is important to observe that in most districts a reduction of wages took place in the autumn of 1894, which enabled farmers to curtail their labour bills without discharging so many men, or giving such irregular employment, as might otherwise have been the case. In the low wage districts, such as Norfolk, Suffolk, Essex, Huntingdonshire, Bedfordshire, Berkshire, Dorsetshire, Wiltshire, and parts of Cambridgeshire, there is reported to have been a considerable amount of distress among those men with families, whose employment has been interfered with by the weather for several days in each week during the latter part of the month.

Reports from some of the Northern Counties stated that a large proportion of those who failed to obtain situations at the November hirings had been able to find little or nothing to do. In Northumberland and North Cumberland, drainers and roadmen were in irregular work in January owing to deep snow and severe frost. In South Cumberland, Westmoreland, and Lancashire, employment of odd-men had been greatly interfered with, though up to January they found employment in repairing damages caused by storms. In Cheshire, odd-men had been irregularly employed owing to frost, and in the county of Durham agricultural labour is reported to have been somewhat scarce. Numbers of odd-men are reported to have been in irregular work near York owing to the severity of the weather.

Reports from the Midland Counties were to the effect that in Shropshire the snow and frost interfered with the employment of odd-men, but not generally of regular men. In Warwickshire,

employment, which was fairly good up to Christmas, was not satisfactory in January, chiefly owing to frost, but partly also to farmers having less work to be done. In Leicestershire, Nottinghamshire, and Rutland, the employment of odd-men was also affected by the hard weather. In Huntingdonshire, reports from nine parishes stated that employment had been irregular. From two of these parishes, the numbers of unemployed were returned as greater than in January 1894, in two parishes about the same, and in five parishes less.

In the Eastern Counties, irregular work was reported from Lincolnshire, Cambridgeshire, and parts of Essex and Norfolk. This was attributed to severe weather, agricultural depression, and the curtailment of labour bills. In Suffolk, the number of men irregularly employed in January 1895 is said to have been about the same as in January 1894.

As regards the Home Counties, a number of men were reported to be in irregular work in Berkshire, at Reading and in the neighbourhood, but not in larger numbers than in January 1894. In the Unions of Abingdon, Reading, and Wantage, the state of employment is said to have been more satisfactory than in the previous year, with the exception of four parishes, but in three of these parishes a landowner provided employment, and in another the town council gave work three days a week at 2s. for a day of six hours. In the immediate neighbourhood of Buckingham, no men were reported out of work, though this was said not to be the case in some of the surrounding villages. The reports from Hertfordshire, Surrey, Sussex, Kent, and Oxfordshire, were not, on the whole, unsatisfactory, especially in view of the state of the weather.

Reports from the Western Counties stated that in Wiltshire employment was satisfactory in the neighbourhood of Collingbourne, Warminster, Bishopstrow, and North Bradley. But in some districts the numbers of men in irregular work were reported to have considerably increased in January as compared with the previous months. In Gloucestershire, the month of January was unfavourable to odd-men, and this was attributed partly to the weather and partly to agricultural depression. In Herefordshire, employment was fairly satisfactory. In the Wells district of Somersetshire, both the state of the weather and the curtailment of labour made work irregular; while in the Crediton Union of Devonshire, employment on the whole was not unsatisfactory. In the St. Colomb Union of Cornwall, all able-bodied men were employed, but in the Truro Union, a considerable number were in want of work.

PEACH-GROWING IN BELGIUM.

Peaches form a large proportion of the exports of fruit from Belgium, and the system of peach cultivation in that country

has been reported upon in some detail by the United States Consul at Liège.

Before planting peach trees, it is, it appears, the practice of the Belgian grower to thoroughly fertilise the soil with guano or chicken manure. After the tree is planted, a peck of lime is added to every cubic yard of earth, placing it near the surface. As it is necessary to loosen the earth for at least 6 feet square and 3 feet deep, this quantity—a bushel to the tree—may seem large, but the authorities are said to be all agreed that more rather than less would be better.

As the standard tree too often failed to be profitable in Belgium, experiments were made with espaliers (wooden railings), but these were found to be so open and exposed that the young trees fared very little better upon them than in the orchard. The wall was then tried, not, it is observed, as in England, where mural enclosures are built at great expense for the special protection of delicate fruit, but the sunny sides of the houses, and the system met with such astonishing success that there are few houses to-day in Belgium upon whose southern exposures trees are not trained.

At the time of flowering, various methods are adopted to shield the buds from the action of frost. Experience has shown that the best method is to place branches cut from other trees among the upper boughs of the peach trees. This plan is said to have been attended by good results, though great caution is needed in its application, as too much shade is apt to stifle the buds by excluding the rays of the sun. Another method, until recently very much in vogue, and stated to be always effective, is the employment of mosquito netting or other cheap material, with meshes large enough to admit the free passage of light and air. The old custom of using closely woven cloth, like table or bed linen, at night and removing it in the morning, is said to be more dangerous than the frost itself, as the trees at this season cannot be deprived of air without serious injury; besides, this artificial heat at night, succeeded by the warmth of the sun, hastens their blowing, when the object is to delay it as long as possible. Shading at noon is, it seems, sometimes as essential as covering at night. Small growers are said to succeed very well in protecting their fruit by placing a number of horizontal poles about 18 inches apart, and from 4 to 6 inches from the trees, and covering them with light wisps of straw, but this device is unsightly and makes much litter.

In good situations, penthouses (sheds of wood, thatch, or straw projecting 18 or 20 inches from the wall and covering the tops of the trees) have sometimes been found sufficient to protect the fruit, and are reported to be extremely useful in checking the flow of the sap. An addition to this method, which was introduced in 1876 and found to afford increased protection, consists in providing a curtain made of unthrashed rye straw. This is made

by tying the cut ends of the straw stalks together with twine or garden cord, six or eight in a loop, with spaces of about 3 inches between the wisps, and attaching them to a pole which is suspended under the eaves of the penthouse in front of the trees. The texture, being open, does not prevent the light and air reaching the buds. It might be supposed that this method would hurry the blooms, but it has, in fact, the very opposite effect. The brilliant surface of the straw, by reflecting the sun's rays, keeps the temperature inside lower than that outside. These shields are usually placed in position about the 1st of March, and are not removed, except in cloudy weather, until all danger from frost has passed.

CULTIVATING ONIONS IN EGYPT.

The onion crop of the valley of the Nile is of great importance and brings an increasing amount of money each year to Egypt, as onions are shipped in enormous quantities to England, France, and other European countries, and even to the United States, where they find a ready sale at good prices. So excellent is the quality, that efforts are, it is said, being made in other countries to raise onions from Egyptian seed.

Mr. F. C. Penfield, the United States Consul-General at Cairo, has communicated to his Government some interesting information on the cultivation of onions in Egypt.

The more popular Egyptian onion, known as "Baali," is, it appears, grown in yellow soil, which is sparingly watered while the bulbs are maturing, in order that the onions may stand a lengthy sea voyage with little risk of "sprouting."

The first stage of cultivation covers the season of the sprouts for transplanting. Toward the end of August, or the beginning of September, the land intended for the onion crop is irrigated from the Nile. After letting the water run off, the soil is left to dry until the first ploughing, when the ploughshare penetrates not deeper than four fingers' breadth. All clods of earth are broken up and pulverised. The land is then divided into plots about 10 feet square and stirred lightly with a double-headed mattock—the favourite implement of the Egyptian farmer—one side being broad like an adze and the other like a pickaxe. The seed is then scattered freely and evenly at the rate of something under two bushels to the acre. After sowing, a "plank" is passed lightly over the soil to cover the seed and bring the plots to the same level. The plots are then irrigated, the islets along the Nile being irrigated four times and the raised lands six times. The first irrigation takes place immediately after sowing, while a second and very light watering is given as soon as the plants appear above ground, and the borders of the plots are

sprinkled. If the seed is planted in raised land, manure at the rate of about one peck of light manure for each plot is applied, but if sown in low ground there is no need of manure. A third watering is given 10 days after the second, and a fourth 10 days after the third, the plots being filled with water in the fourth stage. After the last watering, both islets and raised lands remain undisturbed for 10 days. The onions ripen in the first fortnight in October and are then unearthed.

The second stage of cultivation covers the period from the transplanted sprouts to the mature onions. The best land intended for "Baali" onions is either "islet-soil" of good quality, with no weeds or grass, or yellow land of the same quality and damp enough to allow the crop to grow and ripen. It is irrigated in September, and after letting the water run off is left to dry until it can be ploughed. It is ploughed three times, the ploughshare penetrating to a depth of about 8 inches. After the third and last ploughing the onions are set out in furrows at a distance of 4 inches apart.

In ploughing the last time, the cultivator plants the bulbs in the furrow. The plough returning in the second furrow covers them. The stalks or tops of the seed-onions emerge from the soil to a height of four fingers' breadth or more. Every 20 days the weeds are pulled out in order that the onions may be clear and allowed to develop. In the month of April, the tops die, and the onions are pulled, and, when perfectly dry, are packed in coarse sacks and sent to market. "Baali" onions in their second stage are never watered directly.

"Miskaoui" onions absorb so much moisture from the frequently irrigated ground in which they grow that they are seldom sent abroad. They are sown in the same way as the "Baali"—that is, the sprouts are used as seed, and any grade of soil can be made use of. The land is irrigated at the beginning of September, and after the water has run off, it is left to dry until it can be ploughed. It is ploughed twice and divided into plots 10 feet square, each furrow being $2\frac{1}{2}$ inches deep and nearly 5 inches wide. The plants are laid in the furrows at distances of 4 inches, and the water is immediately let in. The second irrigation occurs in 12 days, and the third in 24 days; after this the soil is watered every eight days. The number of waterings is, therefore, 11 or 12. The ground is then left 10 days without watering, and the onions ripen and are unearthed. They are known to be mature when the tops become dry.

The cultivator plants the sprouts in the furrows head down, burying them to a depth of four fingers' breadth, and lets in the water, as stated above. The unearthing of the "Miskaoui," as well as the "Baali," is done with the hand if the soil be yellow, and with a mattock in the case of black soil.

It may be observed here that in 1893 the imports into the United Kingdom of raw onions from Egypt amounted to 997,648 bushels of the value of 196,163*l*. The total imports into the

United Kingdom of raw onions from all sources in 1893 and the previous year were as under:—

Countries.	Quantities.		Values.	
	1892.	1893.	1892.	1893.
	Bushels.	Bushels.	£	£
From Germany -	219,950	173,238	38,648	35,140
„ Holland -	1,007,852	867,588	146,450	132,255
„ Belgium -	28,934	142,562	3,922	23,603
„ France -	593,579	803,341	73,234	108,724
„ Portugal -	428,774	407,576	82,841	78,167
„ Spain -	1,073,926	1,193,963	180,031	191,655
„ Turkey -	—	44,412	—	10,171
„ Egypt -	949,859	997,648	178,534	196,163
„ other foreign countries.	11,384	27,672	2,571	4,976
Total from foreign countries.	4,314,258	4,658,000	706,231	780,854
From Malta -	102,925	—	17,373	—
„ other British Possessions.	3,093	—	436	—
Total from British Possessions.	106,018	13,809	17,809	2,551
Total -	4,420,276	4,671,809	724,040	783,405

XI.—EXTRACTS FROM DIPLOMATIC AND CONSULAR
REPORTS

TRANS-CAUCASIAN FORESTS.

In a report to the Foreign Office for the year 1894 on the agricultural condition of the Batoum Consular District, Mr. P. Stevens, Her Majesty's Consul at that town, states that the forest area of the Trans-Caucasus is immense, amounting to close upon 13,000,000 acres, but unfortunately these vast forests which should, if properly worked, be a source of enormous wealth to the country, are practically speaking absolutely unproductive when the whole area is taken into consideration.

Forests of pines and firs of various kinds, and beech now predominate in Trans-Caucasia, although traces abound to show that formerly very extensive forests of oak were spread over exceedingly large areas, but by far the greater part of these have now disappeared, and it is evident that they have been cut down by former generations for the sake of the leaves, which have been used as fodder for cattle in years of scarcity.

In considering the question of the forest industry in Trans-Caucasia, Mr. Stevens says that it is impossible not to regret the deplorable state of affairs which now prevails, more especially when the splendid results attained by such countries as Austria and Germany, thanks to their forestry organisations, are called to mind.

The neglect which takes place in the exploitation of a forest in the Trans-Caucasus is said to be very patent. Instead of careful and systematic development going hand in hand with remunerative enterprise, there is nothing but a disregard of even the elementary economic and natural principles which should govern the prosecution of this branch of industry. The root of this evil is, it appears, to be found in the want of regulations providing for the working of the forests on an improved and rational system, combined with an active supervision on the part of an efficient staff duly empowered to enforce the strict observance of such regulations by the parties concerned.

It is a universally admitted fact that the greatest possible injury is caused to pine forests by the felling of trees which are not removed. Dead trunks, if left in the forest, harbour all kinds of harmful insects, the ravages of which eventually destroy the surrounding trees; and if once a forest becomes choked up with dead rubbish it is practically ruined. The exploitation of forests in the Trans-Caucasus is, it is observed, taken up, as a rule, by lessees who have but one object in view, and that is, to get out as much wood as possible in the shortest possible time.

The consequence is that, in many cases, trees are felled the trunks of which either can never be removed from the place where they fall, or have to be shot down the mountain side at some spot where a very large number of them are broken and rendered useless. These are left to rot where they lie and propagate insects which destroy the standing trees. In this connexion, a single instance is given as an example of many: on a comparatively small estate in Swanetia, out of 39,500 trunks felled, only 25,030 were removed, and 14,470 were left to rot in the forest. Apparently the only restriction which is observed to any extent is that prohibiting the felling of any trees under 12 inches in diameter.

The following trees are said to be abundant in the Batoum district and along the littoral of the Black Sea in general: various kinds of pines and firs, beech, hornbeam, maple, Siberian elm, ash, plane, walnut, oak, alder, and boxwood.

[*Foreign Office Report, Annual Series, No. 1481. Price 1½d.*]

SWISS TRADE IN AGRICULTURAL PRODUCTS.

In a report by Lord Vaux of Harrowden on the trade of Switzerland during the year 1893, which was transmitted to the Foreign Office in December last by Mr. F. R. St. John, Her Majesty's Minister at Berne, it is stated that the great drought of 1893 left a deep impression on agriculture, which is so important a branch of Swiss industry. The imports of cattle and pigs were about half what they had been in 1891, while nearly 1,000,000*l.* worth of forage and cattle feeding stuffs were imported, against a little more than 500,000*l.* worth in 1892. The import of fresh meat diminished 43 per cent., preserved meat 30 per cent., and lard 31 per cent.; on the other hand, the increased export of cattle, and especially of cows, amounted to 12,977 head (or 85 per cent.) more than in the previous year. There was also an increased importation of wheat and flour. The price of cattle fell very much, but the good hay crop of 1894 raised it again, and Switzerland is now engaged in buying back the cattle she sold in 1893, but at much higher prices. In the first six months of 1894, 21,829 head of cattle more than in the corresponding period of 1893 were imported.

The export of dairy produce, which had fallen steadily and considerably from 1885 to 1888, regularly increased since that year, and in 1893 had nearly reached the figure of 1885. In 1892, it was, indeed, rather above the figure of 1885, while in 1893, it was slightly below it, and the diminution was due to the lessened export of cheese and butter to France, and of cheese to Italy, while the diminished export to Germany was about compensated for by the increase to Russia and Scandinavia. The

exports of butter, though inferior to those of 1892, were considerably higher than those of 1890 and 1891; the prices also were better in consequence of the dearth of fodder. There was an increased export of condensed milk as well as of milk and farinaceous foods. The import of butter and margarine rose considerably; that of cheese, especially of French sorts, fell off about 75 per cent. The total value of Swiss dairy produce exported in 1893, which appears to have been a fair average year, amounted to 2,396,000*l*.

All grains, most fruits, and especially vines, gave an abundant harvest; nevertheless the importation of all these products except wine increased. The quantity of wheat imported in 1893 exceeded that imported in 1892, and was about equal to the figures of 1890 and 1891, but the price was much lower. Rice remained about stationary in quantity, but grain prices fell all round except for oats. Potatoes were good and dearer; the import of barley increased 20 per cent., and that of malt 11 per cent., the great heat having been responsible for a considerable increase in the consumption of beer, but this increase benefited the native industry almost exclusively.

[*Foreign Office Report, Annual Series, No. 1490. Price 1½*d*.*]

AGRICULTURAL DEPRESSION IN POLAND.

The Foreign Office has recently issued a Report from Mr. Henry Grant, Her Majesty's Consul-General at Warsaw, containing the translation of an authoritative Memorial on the position of landed proprietors in Poland. This Memorial has been presented to the Commission for the Revision of Russian Railway Tariffs in the hope that some changes may be made in favour of Polish growers of cereals, as it is held that the differential rates which have obtained since 1889 amount to a premium to the growers of corn in distant parts of Russia against the Poles.

Reference is made in the Memorial to recent publications of the Russian Agricultural Department, in which are given minute details of the rise and fall in the average price of land in the whole of Russia, except the Kingdom of Poland, during the thirty years from 1860 to 1889. These thirty years are divided into two periods: the first from 1860 to 1883, during which the price of land in Russia rose everywhere and continually; the second from 1883 to 1889, during which this upward movement not only ceased, but, in most Governments, turned in the opposite direction.

The Kingdom of Poland, it is stated, belongs to those districts where the price of land has diminished by 28 per cent., which is the maximum depreciation recorded in the whole Empire. Although there appears to be no doubt that the fall in the price of

rye accounts for the depreciation in the price of land in general, it is not sufficient to explain why the depreciation in the Kingdom of Poland has been double that of any other Government in the Empire.

The proportion of the wheat crop to the rye crop in the Kingdom of Poland is 1 to 3, or approximately the same as in the Government of Saratoff, where it is 14 to 42·4. In the Government of Kursk the proportion is 16 to 35, in that of Volhynia 15·4 to 31·5, and in that of Ufa 9·4 to 44·9. But the price of land only fell 15 per cent. in the Government of Saratoff, and 9 per cent. in that of Kursk, while in Volhynia it increased 14 per cent., and in the Government of Ufa 38 per cent. It is said to follow, therefore, that the fall in the price of land in the Kingdom of Poland cannot have been caused by any excessive production of rye.

The soil of the Kingdom of Poland, with only a few exceptions, is mostly of medium quality, but the average yield up to 1889 has been 25 per cent. to 50 per cent. higher than in the best districts of the Empire. This result, it is maintained, can only be due to a more intensive cultivation and to more labour and money spent per unit acre, which is proved by statistics, among others those relating to the number of cattle per acre in the Kingdom of Poland as compared with the other districts.

The Russian Agricultural Department has divided the whole area of the Empire into eight classes of land, according to the quantity of manure used. The first class comprises land that is not manured at all. On the second to the fifth class inclusive, manure is used to the extent of from $\frac{1}{2}$ cwt. to 26 cwts. per acre; on the sixth from 26 to 39 cwts.; on the seventh from 39 to 65 cwts. per acre; and on the eighth over 65 cwts. Now nine Governments of the Kingdom of Poland belong to the sixth class, and the Government of Warsaw to the seventh, and yet the price of land has fallen 28 per cent., as stated above. It is concluded, therefore, that there exists a close relation between the capital and labour expended on the land and the fall in the value thereof. That is to say, the more highly cultivated a district has been, the more it has suffered from the crisis.

The cost of growing wheat in Poland is investigated by reference to the methods of cultivation, the price of land and the cost of labour, with the result that the cost of producing corn in Poland is said to range from 16 to 48 per cent. higher than in Russia. The labour bestowed on every acre of cultivated land is said to be far greater, and the taxation of land from five to six times higher than in all the other corn-exporting districts of the Empire.

An attempt is made in the Memorial to explain why the agricultural crisis in Russia, which began in 1880, has a more acute character in the kingdom than in the other districts, and threatens the ruin of all agriculture in Poland.

The principal cause of this circumstance is attributed to the geographical position and the natural conditions of the kingdom, in consequence of which a greater intensity of culture has become necessary; another reason is that the expenses of cultivation are much higher. These expenses are, it seems, so great that, coupled with the high land-tax, they compel nearly one-half of the Polish landowners to work at a loss, and their estates have either already been sold by auction (entailing deterioration of cultivation for many years to come), or are to be sold at no very distant date.

It is pointed out, also, that the agricultural depression has weighed as heavily on the peasants as on the larger proprietors. The crisis has diminished the income of 72 per cent. of the population in the kingdom, and lessened the purchasing power of the peasant. And if the peasant's direct loss is less, because he possesses less land, his indirect loss is greater, because the diminished intensity of cultivation lessens the demand for labour, and consequently lowers wages. The emigration of the peasants to Brazil in 1890-91 is alluded to as being strong evidence of this state of things.

[*Foreign Office Report, Miscellaneous Series, No. 347. Price 3½d.*]

AGRICULTURE IN SOUTH RUSSIA.

In a report to the Foreign Office for the year 1894 on the agricultural condition of the district of the Consulate-General of Odessa, Colonel C. E. Stewart, gives some interesting information as to the position of agriculturists in South Russia.

The Odessa consular district extends over ten of the largest provinces in South Russia, where almost every variety of cultivation obtains, from the vineyards of Bessarabia and the Crimea, producing very large quantities of wine, to the wheat and rye of the more northern portion.

The crops of 1894 on the whole were of a decidedly disappointing character. Early in the spring, the winter wheat, which is the great crop of the more northern provinces of these Governments, suffered in consequence of the absence of snow in the winter to cover it from the effects of frost. In some places it was ploughed up and spring wheat or other crops sown in its place, but in very many places it quite recovered itself in the genial weather of the spring, and up to nearly the time of harvest there was good promise of an abundant crop of both winter and spring wheat, but just before and during the harvest operations heavy rain fell, damaging the crops while they were in the field and discolouring them a good deal. Also, in consequence of the rainy season, there was an abundance of straw, which in Russia is of no value whatever, and is used for fuel in the steam thrashing

machines, but the wheat and barley did not thrash out well. There was a great deal of tail corn, and the weight of almost all the grain was considerably below the average; this, with discolouration, reduced the price of the wheat and barley very much as an export article for Western European consumption, though there will be an ample supply for home use.

In Kieff, and some of the more northern provinces, a fair harvest was obtained, but in the southern provinces, especially near Odessa itself, the harvest was much below the average.

At the prices at present prevailing in Russia, the farmer receives about 12s. a quarter for his wheat, which means ruin in a country where labour is comparatively highly paid, and where the taxes are considerable.

A smaller area was sown with wheat in the south of Russia in the year 1894 than in previous years. Every sort of crop is being tried by the better class of cultivators to recoup themselves for the losses on the ordinary grain crops of wheat, barley, rye, and oats. Oil seeds of all descriptions, especially sunflower seed, have been tried, and so far with fairly good results, but undoubtedly within a few years, as the area of land under these crops increases, the price obtained for oil seeds must fall.

Colonel Stewart states, also, that the low price of wheat, which sells in fact at much less than it takes to grow it, has proved disastrous to most of the tenant farmers, who find themselves in great distress, while it is simply a question of time as to how long landowners will be able to hold out. It is, therefore, not surprising to find that the acreage of wheat is yearly decreasing, and in the Governments of Kieff and Podolia it would be difficult to find an estate where the decrease was less than 50 per cent., while on others wheat is no longer sown. In place of wheat, beans, peas, lentils, sunflower, poppy, rape, hemp, and flax are being sown; but the question arises: how long will present prices for these products remain remunerative when the acreage is so largely increased?

A large number of landowners have found it absolutely necessary to reduce rents of farms from 10 to 30 per cent. in order to retain tenants. One large estate, as good land as is to be found in the Kieff Government, has lately been let at 5s. 4d. per acre. Three other estates have been thrown on the proprietors' hands, because the present rents of 6s. 3d. and 7s. per acre could not be reduced.

The acreage of farms rented by peasants varies considerably as the harvest may be good or bad, the area being increased after good, and reduced after bad harvests. In 1891, they rented 167,750 acres, in 1892, 132,000 acres, and in 1893, 143,457 acres. The rents ranged from 6s. to 13s. per acre for good winter crop land, and 4s. 6d. to 8s. 6d. per acre for spring crop land.

There seems to be no question of fixity of tenure, the peasant renting from year to year in any part nearest his village which suits his fancy.

The great scarcity of labourers experienced in 1893 was intensified during harvest operations of 1894, so that parties of short-term prisoners were drafted from Kieff prison to different estates in this district. The farmers in these southern Governments have been compelled by the bad harvests of late years to adopt the method of paying "in kind"; they give the peasants a certain per-centage of sheaves, the average this year ranging from every fifth to every seventh. These sheaves are then thrashed, and the grain sold at market price, a manner of payment which is far from profitable as prices now rule.

[*Foreign Office Report, Annual Series, No. 1487. Price 1d.*]

THE CULTIVATION OF WHEAT IN PORTUGAL.

The Annual Report on the Trade of Portugal for the year 1893, drawn up by Mr. Conway Thornton, Secretary of Her Majesty's Legation at Lisbon, has recently been issued by the Foreign Office.

In a statement of the imports into Portugal during 1893, it is shown that the following quantities of cereals were received from abroad:—

Cereals.	Kilos.	Equivalent in Cwts.
Barley, in grain	1,962,248	38,544
Cereals, in grain, not specifically mentioned	37,825	743
Wheaten flour	1,442,468	28,334
Flour of other cereals	2,399	47
Maize, in grain	7,353,465	144,443
Wheat, in grain	144,400,471	2,836,438

Mr. Thornton states that the most important item in the list of imports was "articles of food," and the chief of these was wheat. It was hoped, but in vain, that the transformation going on in many parts of the country of vineyards into corn land would result in the disappearance of this particular import, but the substitution of cereals for vines proved a more tedious and costly affair than had been anticipated. The old system required no animal labour or manure; the new one demanded both of these to a very large extent. The implements used in the first case had become useless and valueless; articles of a widely different character had now to be purchased and their manipulation learnt. The cereals sown in the exhausted vineyards gave at first but sorry returns, and the necessity for supplies of foreign wheat continued to exist and to increase,

whilst, to crown the general misfortunes, three bad harvest seasons occurred consecutively.

Another factor in the cereal question in Portugal has been the taste of the consumer. With the influx of foreign wheat came the installation of steam mills, the result of both being a fine white flour, pleasing to the eye, made chiefly from American wheat, easily ground and bought on credit, thus enabling the miller to sell on credit to the baker. The native wheats are very nutritious, but dark in colour; they are hard to grind, and the small farmer can only afford to sell for cash.

Native wheat was thus limited to the consumption of the rural districts, and would speedily have gone to unremunerative prices but for the special legislation which imposes restrictions upon the importation of foreign wheat for so long as it can be shown that a stock of native wheat is available for the miller.

[*Foreign Office Report, No. 1483, Annual Series. Price 2½d.*]

SWEDISH IMPORT DUTIES ON WHEAT AND FLOUR.

The Board of Agriculture have received from the Foreign Office copies of despatches, transmitted by Her Majesty's Minister at Stockholm, relating to the proposed increase in the Swedish duties on imports of wheat and flour. It seems that ever since the policy of protection on native manufactures gained favour in Sweden, the landed classes generally have urged the necessity of affording them equal protection to that granted to the manufacturers. Whether it was an unwillingness to encounter the unpopularity of raising the price of bread or not, years passed without anything being done. Last autumn, however, persistent efforts were made to induce the Ministers to raise the duties by Royal decree, and the support given to this movement was so great, that the corn-importing houses took alarm, and hastened the arrival of extensive supplies from the neighbouring countries, principally from Russia.

The Swedish Government have, however, lately taken action and issued a decree, which raises the duties about 150 per cent. As a measure of immediate help to the agricultural classes it is not likely to have much effect, as the large supplies already introduced will meet the wants of at least the present year.

The announcement was made in the "*Post och Turikes Tidning*" of the 7th of January last to the effect that the Swedish Government had resolved upon a considerable increase in the existing import duties on corn, malt, and flour, and that the new duties were to come into force from that date.

The following statement shows the new Swedish import duties on corn, malt, and flour compared with those previously in force :—

	New Tariff.		Old Tariff.	
	Per 100 Kilo-grammes.	Per Bushel.	Per 100 Kilo-grammes.	Per Bushel.
Corn, unground (rye, wheat, barley, maize, peas, beans, and other kinds not specified).	s. d. 3 6	s. d. 0 11·45	s. d. 1 4½	d. 4·50
Malt - - - - -	4 5½	1 2·54	1 8	5·45
Flour - - - - -	7 2½	1 11·63	2 8½	8·86

The subject was referred to by the King of Sweden in his opening speech to the Riksdag on the 17th January last as follows:—

“The crops gathered in during the past year have been calculated as surpassing the average harvest, but the decrease in price, which has affected almost all agricultural products—and, first and foremost, grain—has, however, excited great anxiety among farmers. I have, therefore, considered it necessary to lay a proposition before you concerning an increase in the present rates of customs duty on unground and ground corn.”

“In virtue of the authority entrusted to me by the Constitution and to prevent an import simply caused by speculation, I have decided for the immediate imposition of increased rates of duty, until according to your decision new enactments will be published by me.”

THE DANISH TRADE IN AGRICULTURAL PRODUCE.

Captain James Boyle, Her Majesty's Consul at Copenhagen, has recently drawn up a Report on the Trade of Denmark, which has been delayed to await the issue of official statistics dealing with the whole of the year 1893. It is stated in the Report that during 1893 the value of the whole trade between Great Britain and Denmark was 11,838,888*l.*, while the average for the five years 1889–93 was 11,272,222*l.*, the increase being entirely due to larger exports of pork, butter, and bacon.

The exports of agricultural produce to the United Kingdom during the year comprised 93,115,000 lbs. of pork and bacon; 104,253,600 lbs. of butter; 133,600,000 eggs; and 803,752 bushels of barley. Compared with 1892 there was an increased export of pork and of bacon, amounting to about eight million pounds, and of nearly seven million pounds in the case of butter.

It seems that in spite of great difficulties in the beginning of the year, owing, firstly, to ice; secondly, to the great cotton

spinners' strike in Lancashire, and, thirdly, to the coal strikes, the butter trade on the whole succeeded very well. This was principally due to the great drought in France, England, and Ireland, whereby the competition of these countries was considerably weakened. At the same time, the English market did not receive so large a supply from America and France, the imported quantity from these countries being 12,000,000 to 13,000,000 lbs. (avoir.) less than the year before.

The exportation of eggs showed a decrease of about 1,000,000 score, due, it is said, to the various strikes in the English market.

The consumption of margarine as food in Denmark is continually increasing, although its manufacture there is still on the decline. The Danish margarine law of 1891, a section of which provides that "in places where butter is worked up for sale, where butter is packed or collected for export, there must not be found either margarine or oleomargarine," is most rigidly enforced, and the penalty for breaking it is imprisonment, or, if without fraudulent intent, a fine varying from 50 to 4,000 kroner (2*l.* 15*s.* 6*d.* to 222*l.* 4*s.* 5*d.*) is imposed.

[*Foreign Office Report, Annual Series, No. 1491. Price 1*d.**]

STATISTICS OF ITALIAN CATTLE.

A Report on the Commerce, Industries, Agriculture, and Finance of the Kingdom of Italy for the year 1893 has recently been issued by the Foreign Office. The report, which has been drawn up from official sources by the Hon. H. G. Edwards, Secretary to Her Majesty's Embassy at Rome, contains some information as to the number of cattle in Italy.

According to the statistics of 1875 there were 3,489,125 head of cattle in Italy. The census of 1881 showed a total of 4,783,232, consisting of 45,092 breeding bulls; 2,366,556 cows and heifers; 1,403,207 oxen and heifers; 957,307 calves, male and female; and 11,070 buffaloes. This would show an increase of about 1,300,000 head, but there are reasons to believe that the returns for the year 1875 were far from being accurate.

It is, however, said to be a well-established fact that during the last 10 years the number of cattle has been steadily increasing, especially as regards milch cows. This increase has been noted in almost every province of Upper Italy, chiefly in the province of Venetia, as well as in the Marche and the Romagna, and in certain parts of Sicily. It would appear that in other parts of Italy, cattle breeding has remained where it was or has been very limited. It is consequently inferred that the aggregate increase is in the proportion of one-twentieth of cattle, as returned by the census of 1881. Agricultural improvements, the development of the system of dairies, the increase of home

consumption of meat, the promising exportation of cattle in 1882 and 1883 can all be held as arguments in favour of this inference. The result would then be that the number of head of cattle at present in Italy is about 5,000,000.

The returns drawn up by the Italian Ministry of Agriculture show the live weight of the cattle in the kingdom. Some of these returns have been drawn up on the basis of the weight of live cattle taken to the slaughter-houses, others on weights established for the purpose. The average weights per head as given in the Report range from $34\frac{1}{2}$ stone for Sardinian cattle to $73\frac{1}{2}$ stone for Piedmontese lowland breed; while the mean live weight per head of cattle of all breeds works out to 57 stone.

[*Foreign Office Report, Annual Series, No. 1485. Price 5½d.*]

CANALS IN FRANCE.

A Report on the Development of Canal Traffic in France has recently been prepared for the Foreign Office by the Hon. C. Hardinge, Second Secretary to Her Majesty's Embassy at Paris.

In 1892, there were in France 7,747 miles of canals and inland waters open to navigation, of which 3,003 miles were canals in the simple sense of the word, the remaining 4,744 miles being navigable rivers, streams, lakes, and ponds. Nearly the whole of the system of inland navigation is administered by the State, only a very small portion being conceded. Thus out of 7,747 miles, only 536 miles have been handed over to concessionaires, against 7,211 miles which are managed by the State.

A law was passed on 5th August 1879 by which the waterways forming the chief lines of communication should be divided into two classes, viz., principal lines, and lines of secondary importance. According to the text of that law, it is necessary that on the principal lines there should be at least a depth of $6\frac{1}{2}$ feet of water, and the locks should be at least 126 feet long by 17 feet broad.

Thanks to the improvements made since 1879, a great impetus has been given to the carrying trade by inland waters. Thus the weight of goods carried on canals rose from 19,740,000 tons in 1881 to 25,200,000 tons in 1891. In 1892, agricultural and alimentary products absorbed $14\frac{1}{2}$ per cent., and manures $5\frac{1}{2}$ per cent., of the total tonnage transported by inland navigation.

The traction of barges on rivers like the Seine is performed by steam tug-boats and steam tugs by means of a sunken chain, and leaves, on the whole, little room for improvement. This is not the case, however, on the canals where traction by steam tugs is not practicable owing to the great number of the locks.

On the canals of the centre of France, the boats are generally towed by the bargee and his family, with the assistance sometimes of a donkey kept on board. This is the most economical form of traction, but is applicable only to small boats, and has the disadvantage of being a very slow and tedious mode of progression.

In the north and east of France, the towing is generally performed by horses, in relays of two horses under the charge of a carter. Two horses are generally sufficient to tow a boat heavily laden, or two empty boats coupled together. With this system barges are able to cover 10 to 20 miles per diem, the distance, of course, depending a great deal upon the time lost by them in passing through the locks.

On a few canals where the circulation is very great, the organisation of the means of traction has been undertaken by the State with the greatest possible success, and it has contributed enormously to the development of traffic in those regions.

The report does not otherwise deal with the effect which the development of the canal system has had on the agricultural districts of France owing to the impossibility of obtaining any information on this subject.

[*Foreign Office Report, Miscellaneous Series, No. 342. Price 9½d.*]

SPANISH CORN DUTIES.

The Board of Agriculture have received information through the Foreign Office, from Her Majesty's Minister at Madrid, relative to an increase in the duties on wheat and wheat flour imported into Spain.

By a Decree which came into force on February 11, 1895, the import duty on foreign wheat was increased by 2 pesetas 50 centimos per 100 kilogrammes (equal to 4s. 4¼d. per quarter), bringing the duty on wheat grain up to 18s. 4d. per quarter.

The duty on wheat flour was also increased by 4 pesetas 12 centimos per 100 kilogrammes (equal to 1s. 8d. per cwt.), so that the import duty on foreign flour is now 7s. 0½d. per cwt.

The new duties are to continue in force until the end of the present year, and they apply to all wheat and flour imported into Spain and the Balearic Isles. The Government propose as soon as possible to lay a project before the Cortes for reducing the freights on agricultural products between the district of production and the ports and frontier towns, and also the freights on cattle from producing to consuming districts.

THE EXTENSION OF THE CANAL SYSTEM AS AFFECTING
AGRICULTURE IN GERMANY.

In a report to the Foreign Office upon the inland waterways of Germany, prepared by Mr. J. B. Whitehead, Second Secretary to Her Majesty's Embassy at Berlin, it is stated that the extension of the canal system and the general improvement of the waterways shares the fate in Germany of the improvement and cheapening of railway communication, viz., it is first warmly desired and supported by the agricultural interest, and afterwards complained of. The reason is said to lie in the circumstance that the cheaper rates of transport afforded by the canals do not benefit home production alone, but give an equal advantage to the foreign importer of agricultural produce, consequently every agriculturist who is now suffering from foreign competition is inclined to deplore further reductions in the cost of transport. If Germany were still an exporting State as regards agricultural products, the matter would, it is suggested, probably be different, and any improvement in this respect might be welcomed. As things stand at present, the agricultural interest cannot be said to favour the extension of the canal system.

In the general interests of traffic, canals are considered to play a useful part in relieving the railways, the capabilities of which are limited, from a large amount of heavy goods traffic, and by preventing the railway rates from being raised to an undue height. But this argument, although warmly maintained by the partisans of the canal system, is assailed with equal vigour by the supporters of the railways. It is maintained that agriculturists could only be proved to gain a direct advantage from the extension of the waterways if the foreign competitor were excluded from the benefit, and even then the interests of the different parts of the country would probably clash.

The Westphalian coal and iron industries are naturally in favour of canals, as they are sufficiently protected by customs duties, and every cheapening of the rates of freight for ores, coal, and iron is to their direct advantage. The agriculturists of the eastern provinces would also be in favour of canals such as would enable them to bring their products cheaply to the markets of the thickly populated industrial districts of the west. It is hoped, for instance, that after the completion of the North Sea and Baltic Ship Canal, and the Dortmund-Ems Canal, it will be possible to send grain by steamer from East and West Prussia, Posen, and Pomerania, by way of Königsberg, Danzig, and Stettin, to Emden, and thence by the new canal to the industrial districts of Westphalia. The agriculturists of Westphalia, the Rhine Province, and the Province of Saxony naturally look upon this prospect from quite a different point of view, and both parties are apprehensive that the new canals will facilitate the importation of American and Russian wheat, and will cause a further depression of German agriculture. It seems that the

so-called "Mittelland" canal project, if it could be made so as to afford a practicable waterway from east to west without communicating directly with the Russian waterways, would not be open to this objection, and would be of great benefit to the eastern agriculturists. The western industries would also profit by the cheapening of the rates of freights eastwards, but the agriculture of the central and western provinces would suffer by it. The latter, however, is said to have a sufficient advantage by being in the neighbourhood of the great consuming centres to be able to support this loss.

What has been said of canals applies equally to the navigable rivers—the Oder, the Elbe, and the Rhine serve far more for the importation of foreign grain than for the transport of the home-grown article.

The position of the forest industries with regard to canals is, it appears, similar to that of agriculture. They gladly avail themselves of water carriage for their heavy transports of timber and wood, but they deplore the facilities which the waterways afford for the importation of timber from Russia, Sweden, and Bohemia.

The attitude of the Conservative party (which practically represents the agricultural interest) and of that part of the Centre party which is connected with agriculture, on the occasion of the debates on the recent Canal Bills in the Prussian House of Deputies, shows that the majority of agriculturists are at present rather opposed to, than in favour of, an extension of the canal system.

[*Foreign Office Report, Miscellaneous Series, No. 345.*
Price 10d.]

XII.—PRICES OF LIVE STOCK AS RETURNED UNDER THE MARKETS AND FAIRS (WEIGHING OF CATTLE) ACT, 1891.

Under the Markets and Fairs (Weighing of Cattle) Act, 1891, the Board of Agriculture receive weekly, from nineteen scheduled places, returns intended to show the number of animals entering the public markets or auction marts, and the number of those whereof the live-weights were ascertained on the weighbridges provided in accordance with the requirements of the Weighing of Cattle Acts, 1887 and 1891. These returns are further meant to show, so far as can be ascertained by the market authorities and auctioneers respectively, the current prices per live stone or live cwt. These statistics have now been collected for two years, and the total number of cattle, sheep, and swine reported to the Board as entering, as weighed, and as priced within the scheduled places stands as under:—

Animals.	1893.	1894.
CATTLE :	No.	No.
Entering markets - - - -	1,219,208	1,203,533
Weighed - - - - -	92,492	96,344
Prices returned - - - -	84,403	84,593
Prices returned with breed and quality distinguished.	57,323	58,559
SHEEP :		
Entering markets - - - -	4,854,732	4,649,277
Weighed - - - - -	38,177	39,210
Prices returned with breed and quality distinguished.	28,180	26,072
SWINE :		
Entering markets - - - -	191,376	139,187
Weighed - - - - -	1,450	2,498
Prices returned - - - -	401	523
Prices returned with breed and quality distinguished.	6	56

It was to be expected that in view of the reduced number of live stock shown in the Agricultural Returns to have existed on the farms of Great Britain in 1894, fewer would have come to market during the year.

An increase, although not a great one, is shown in the numbers weighed, the weighing of cattle having been reported in 96,344 cases against 92,492 in 1893. This is, however, only eight

per cent. of the number shown as entering the markets, and although prices were given for 84,593 of the cattle weighed in 1894, the price records supplied in respect of 26,000 of this number, sold at two important marts in Scotland, were furnished in too defective a shape to be used for comparative purposes in the following tables. The prices of 58,559 cattle were, however, rendered in the prescribed form and have been employed as the basis of the following calculations as to the current prices of cattle in Great Britain.

The practice of weighing sheep increases more slowly than that of cattle, and although the number of swine returned as weighed has increased from 1,450 to 2,498, the cases in which prices are given is still very small, and the details are here also very defective.

Cattle weighing is far more largely practised in Scotland than in other parts of Great Britain. For England, as a whole, the number weighed was 28,351 out of 954,315 entering the markets, while in Scotland, out of not much over a fourth of that total, or 249,218 head, the number weighed was 67,993. These figures give a good idea of the relative extent to which resort is made to the weighbridge, but it should be added that more than half of the cases where cattle are weighed in England are reported from the Metropolitan Cattle Market in London, and more than half of those in Scotland are reported from Edinburgh and Aberdeen. Two-thirds of the numbers weighed in the 19 scheduled places in 1894 were from the three last-named centres. As between the several quarters of the year the weighings reported vary considerably. The last quarter of the year shows the largest total. A notable increase is reported as occurring in London in the three months ending 31st December 1894.

The weighings of sheep are like those of cattle, greater on the whole in Scotland than in England, two markets—Aberdeen and Perth—being the chief centres whence returns of sheep weights are supplied.

In the following table the total figures sent up from each of the scheduled places are exhibited in detail. From this it will be seen that, so far as cattle are concerned, Bristol has reported none weighed in the year 1894, Lincoln only 2, York 13, and Birmingham 17. At Leeds and Wakefield, where over 1,000 in the one case and over 400 in the other were weighed during the year, the market authorities represent themselves as unable to ascertain any quotations of prices.

TOTAL NUMBER of Cattle, Sheep, and Swine, entering the MARKETS and MARTS of the under-mentioned Places in ENGLAND and SCOTLAND, with the Number WEIGHED, as received from the Market Authorities in the Year 1894, under the Markets and Fairs (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	Cattle.			Sheep.			Swine.		
	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.
ENGLAND.	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>
Ashford - - -	13,111	127	99	118,916	48	28	10,890	1	†1
Birmingham - -	29,868	17	4	95,321	—	—	—	—	—
Bristol - - -	69,981	—	—	141,640	—	—	27	—	—
Leicester - - -	66,525	908	773	91,505	162	162	3,227	26	26
Leeds - - -	34,745	1,006	—	123,481	1,556	—	6,727	1,959	—
Lincoln - - -	10,305	2	—	75,806	—	—	6,629	—	—
Liverpool - - -	81,136	4,503	4,503	414,237	2,148	2,148	—	—	—
London - - -	98,920	15,432	6,081	834,825	13,496	2,434	607	—	—
Newcastle-upon-Tyne	106,434	1,629	1,629	355,062	10	—	38,648	466	†466
Norwich - - -	94,118	407	407	226,915	—	—	17,235	—	—
Salford - - -	157,204	337	337	696,894	62	62	2,426	21	21
Shrewsbury - - -	35,627	3,433	2,831	70,150	8	—	8,555	16	—
Wakefield - - -	102,955	437	—	251,360	49	—	2,778	—	—
York - - -	53,386	13	13	150,565	—	—	3,137	—	—
SCOTLAND.									
Aberdeen - - -	63,809	13,872	18,872	163,898	13,776	13,706	18,547	—	—
Dundee - - -	17,547	8,435	8,337	23,351	183	97	2,638	9	9
Edinburgh - - -	69,104	29,399	*12,296	251,439	—	—	7,513	—	—
Glasgow - - -	47,064	343	343	388,874	320	285	1,906	—	—
Perth - - -	51,694	10,944	*1,984	170,038	7,392	7,150	7,697	—	—
TOTAL for ENGLAND	954,315	28,351	16,727	3,651,677	17,539	4,834	100,886	2,489	514
TOTAL for SCOTLAND	249,218	67,963	*41,832	997,600	21,671	21,238	38,301	9	9
Total - - -	1,203,533	96,344	*58,559	4,649,277	39,210	26,072	139,187	2,498	†523

* Prices for 17,074 cattle in addition to the above were quoted from Edinburgh, and for 8,960 cattle from Perth, but without distinguishing breed or quality.

† Prices given but details insufficiently furnished.

‡ The details for 56 swine only were furnished in the form prescribed.

Selecting the markets from which a sufficiently numerous series of quotations of prices has been furnished, the following statement represents the range of prices per live cwt. during the two years for which these returns have been rendered:—

Places.	Inferior, or Third Quality.		Good, or Second Quality.		Prime, or First Quality.	
	1894.	1893.	1894.	1893.	1894.	1893.
ENGLAND:	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.
Liverpool -	—	23s. 8d. to 28s.	27s. 8d. to 29s. 6d.	28s. to 29s. 8d.	31s. 2d. to 34s. 4d.	33s. 2d. to 35s. 8d.
London -	21s. 4d. to 33s. 2d.	25s. 4d. to 32s. 10d.	28s. 8d. to 37s. 4d.	30s. 4d. to 40s.	34s. to 40s. 8d.	37s. 2d. to 42s. 10d.
Newcastle -	—	—	22s. to 36s. 2d.	29s. to 38s.	27s. 10d. to 37s. 4d.	28s. 4d. to 42s. 6d.
Shrewsbury -	16s. 2d. to 27s. 4d.	14s. 6d. to 27s. 10d.	23s. to 33s. 8d.	17s. 8d. to 39s. 4d.	29s. 10d. to 39s. 8d.	25s. 6d. to 35s. 4d.
SCOTLAND:						
Aberdeen -	22s. 8d. to 27s. 6d.	21s. 2d. to 31s. 6d.	24s. to 36s. 6d.	23s. to 37s. 2d.	30s. 10d. to 45s. 4d.	26s. 10d. to 49s. 2d.
Dundee -	21s. to 30s. 6d.	22s. 10d. to 31s.	30s. to 33s. 6d.	29s. 8d. to 35s.	30s. to 36s.	34s. 2d. to 38s.
Edinburgh -	23s. 2d. to 27s. 6d.	21s. 10d. to 29s. 6d.	25s. 4d. to 35s.	23s. to 38s.	32s. 10d. to 44s. 8d.	34s. to 41s. 6d.
Perth -	28s. to 34s.	26s. to 34s. 2d.	30s. 2d. to 33s. 6d.	28s. 6d. to 37s. 4d.	32s. 10d. to 36s. 2d.	32s. 6d. to 39s. 2d.

* Only one animal was returned from Newcastle in this grade, the price shown being 20s. per cwt.

In view of the wide range which these quotations offer, an attempt is made in the next table to show what has been the actual average price per live cwt. of the cattle weighed in the markets above referred to in 1893 and 1894. This average is obtained by dividing the total price by the total weight of the weighed animals of all descriptions in each of the three qualities or grades distinguished by the reporters.

Places.	Inferior or Third Quality.		Good or Second Quality.		Prime or First Quality.	
	1894.	1893.	1894.	1893.	1894.	1893.
ENGLAND:	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.	Per Cwt.
Liverpool -	s. d. —	s. d. 25 4	s. d. 28 4	s. d. 29 4	s. d. 32 4	s. d. 34 6
London -	26 4	28 6	34 0	35 0	38 6	39 4
Newcastle-on-Tyne.	—	—	34 0	31 4	35 4	35 10
Shrewsbury -	24 10	21 4	29 2	23 0	34 4	32 6
SCOTLAND:						
Aberdeen -	24 6	24 10	32 0	33 2	36 2	37 4
Dundee -	26 2	27 2	31 10	33 2	34 1	35 4
Edinburgh -	26 6	26 3	33 3	33 8	34 2	36 0
Perth -	30 4	31 2	32 1	33 2	34 4	35 4

These figures show a closer agreement in Scotland than in England in the two higher grades. This is no doubt due to the greater prevalence of the practice and to the greater familiarity with the methods of live weight quotations in the North.

Comparing the mean quotations of the past year with 1893, the current prices seem slightly lower as a rule, though not

universally so. The prices quoted for cattle of prime or first quality are highest in London and Aberdeen respectively in the two contrasted years. In the second quality quotations the average prices given for the markets of London and of Newcastle are the same in 1894, and they very considerably exceed those of Liverpool and Shrewsbury, which are probably affected by the sales of store cattle in both the years for which returns are available. In Scotland, the Edinburgh prices are in both years slightly above the others. Roughly for the whole of Great Britain it would appear to be safe from these returns to conclude that the average live weight price per cwt. of inferior cattle ranged in the eight markets from 21s. 4d. to 31s. 2d. in 1893, and from 24s. 6d. to 30s. 4d. in 1894; that second class stock were selling at from 28s. to 35s. per cwt. in 1893, and from 28s. 4d. to 34s. in 1894, while prime cattle are reported to have made from 32s. 6d. to 39s. 4d. in 1893, and from 32s. 4d. to 38s. 6d. in 1894.

As it may be of interest to note further the course of prices in the several quarters of the past year, a table has been constructed as under, which supplies this information:—

	England.				Scotland.			
	Liver- pool.	Lon- don.	New- castle.	Shrews- bury.	Aber- deen.	Dun- dee.	Edin- burgh.	Perth.
	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.	Per Cwt. s. d.
First Quarter:—								
Inferior or Third Quality.	—	29 10	—	19 10	24 8	25 11	24 11	29 11
Good or Second Quality.	28 0	35 2	32 6	27 4	31 11	31 11	33 6	32 1
Prime or First Quality.	33 4	39 2	35 2	31 2	36 4	34 3	34 8	33 8
Second Quarter:—								
Inferior or Third Quality.	—	26 6	—	23 10	25 4	27 1	—	30 6
Good or Second Quality.	28 6	36 2	34 10	29 10	32 2	32 0	33 8	32 2
Prime or First Quality.	34 4	38 6	35 8	35 6	36 4	34 2	33 10	34 7
Third Quarter:—								
Inferior or Third Quality.	—	23 0	—	24 4	24 5	27 1	27 6	31 2
Good or Second Quality.	29 6	33 10	33 8	29 2	32 7	31 9	33 11	32 4
Prime or First Quality.	33 6	38 6	36 6	31 8	36 9	34 3	36 0	34 3
Fourth Quarter:—								
Inferior or Third Quality.	—	27 4	—	25 4	23 1	25 2	—	30 0
Good or Second Quality.	27 8	32 4	33 2	29 2	31 8	31 8	35 6	32 1
Prime or First Quality.	31 2	37 8	31 8	33 2	35 9	33 10	36 10	34 4

In continuation of the detailed statistics supplied for the first three quarters of 1894 in the September and December numbers of this Journal, quotations, distinguishing breed and quality, are furnished in the following tables both for cattle and for sheep.

TOTAL NUMBER of Cattle, Sheep, and Swine, entering the MARKETS and MARTS of the under-mentioned Places in ENGLAND and SCOTLAND, with the number WEIGHED, as received from the Market Authorities in the Fourth Quarter 1894, under the Markets and Fairs (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70).

PLACES.	Cattle.			Sheep.			Swine.		
	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.	Total Number entering the Markets or Marts.	Number Weighed.	Number Weighed for which Prices were given.
ENGLAND.	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>
Ashford - -	3,293	33	23	25,663	—	—	3,587	—	—
Birmingham - -	6,368	1	1	14,239	—	—	—	—	—
Bristol - - -	18,486	—	—	22,020	—	—	10	—	—
Leicester - - -	15,255	589	460	22,566	71	71	1,153	26	26
Leeds - - -	8,364	288	—	23,120	54	—	1,896	562	—
Lincoln - - -	2,634	—	—	14,704	—	—	1,539	—	—
Liverpool - - -	29,266	1,897	1,897	81,015	267	267	—	—	—
London - - -	32,465	6,124	1,446	154,603	1,864	99	7	—	—
Newcastle-upon-Tyne	27,136	106	106	78,887	—	—	16,933	211	†211
Norwich - - -	31,689	119	119	23,268	—	—	6,038	—	—
Salford - - -	44,610	120	120	102,593	—	—	842	—	—
Shrewsbury - - -	10,172	1,424	1,277	16,898	—	—	3,271	—	—
Wakefield - - -	27,711	53	—	42,576	—	—	599	—	—
York - - -	19,708	—	—	62,622	—	—	1,028	—	—
SCOTLAND.									
Aberdeen - - -	18,166	4,697	4,697	27,896	2,651	2,601	5,902	—	—
Dundee - - -	4,115	2,377	2,364	5,424	40	40	796	6	6
Edinburgh - - -	20,614	7,818	*3,407	59,385	—	—	2,232	—	—
Glasgow - - -	13,664	64	64	99,099	40	40	930	—	—
Perth - - -	12,848	2,112	*575	41,783	1,851	1,728	2,209	—	—
TOTAL for ENGLAND	277,157	10,754	5,449	684,783	2,256	437	36,903	799	237
TOTAL for SCOTLAND	69,407	17,068	*11,107	233,587	4,582	4,409	12,069	6	6
Total - - -	346,564	27,822	*16,556	918,370	6,838	4,846	48,972	805	†243

* Prices for 4,407 cattle in addition to the above were quoted from Edinburgh, and for 1,537 cattle from Perth, but without distinguishing breed or quality.

† Prices given but details insufficiently furnished.

‡ The details for 32 swine only were furnished in the form prescribed.

NUMBER and PRICES of **Cattle** WEIGHED in the under-mentioned Places in
Fourth Quarter of 1894, under the Markets and Fairs

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals		Average Price.	Animals		Average Price.	Animals		Average Price.
		Weighed.	Per Stone.	Per Cwt.	Weighed.	Per Stone.	Per Cwt.	Weighed.	Per Stone.	Per Cwt.
ENGLAND: Liverpool -	Irish Cross Bred -	No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
		—	—	—	289	3 5½	27 8	1,608	3 10½	31 2
London -	Devons -	—	—	—	19	4 2½	33 8	38	4 8½	37 6
	Devons* -	—	—	—	3	3 10	30 8	—	—	—
	Herefords -	2	3 4½	27 2	37	4 2	33 4	164	4 7½	37 2
	Herefords* -	—	—	—	19	4 2½	33 8	17	4 6½	36 2
	Highland Scots -	—	—	—	—	—	—	5	5 0	40 0
	Highland Scots* -	—	—	—	2	4 2	33 4	—	—	—
	Irish Shorthorns -	—	—	—	3	3 8½	29 8	—	—	—
	Irish Shorthorns* -	6	3 7	28 8	63	3 7	28 8	—	—	—
	Norfolks -	—	—	—	—	—	—	9	4 3½	34 6
	Norfolks* -	—	—	—	—	—	—	2	4 3	34 0
	Polled Scots -	3	3 7½	28 10	72	4 6	36 0	233	4 11½	39 8
	Polled Scots* -	—	—	—	—	—	—	24	4 10½	38 10
	Runts -	12	3 3½	26 2	70	4 1½	32 10	62	4 5½	35 6
	Runts* -	2	3 4	26 8	4	4 0	32 0	43	4 7	36 8
	Shorthorns -	87	3 4½	27 0	196	4 0½	32 2	38	4 5½	35 8
	Shorthorns* -	69	3 5½	27 10	137	3 11½	31 8	5	4 3½	34 6
Newcastle-upon-Tyne.	Cross Bred -	—	—	—	3	3 7½	29 2	11	4 6	36 0
	Herefords -	—	—	—	1	3 2	25 4	4	4 4½	34 10
	Highland Kylee -	—	—	—	—	—	—	10	3 10½	31 0
	Irish -	—	—	—	—	—	—	4	3 11½	31 10
	Polled Angus -	—	—	—	—	—	—	11	3 11	31 4
	Shorthorns -	—	—	—	27	4 2½	33 10	35	3 9½	30 2
Shrewsbury	Cross Bred -	23	3 3½	26 2	9	3 6½	28 4	4	3 8½	29 10
	Herefords -	24	2 11½	23 10	62	3 5½	27 10	31	3 10½	31 0
	Shorthorns -	3	2 10	22 8	17	3 4½	28 10	9	3 9½	30 2
	Welsh -	—	—	—	—	—	—	1	4 4	34 8
	Cross Bred (Stores)	34	2 11½	23 6	26	3 6½	28 2	17	4 5	35 4
	Galloways (Stores)	—	—	—	31	3 8½	29 6	33	4 2½	33 6
	Herefords (Stores)	47	3 3	26 0	148	3 9½	30 2	25	4 3½	34 6
	Polled Angus (Stores)	45	3 5	27 4	53	3 10	30 8	79	4 1½	32 10
	Shorthorns (Stores)	301	3 2½	25 6	97	3 7½	28 10	24	4 1½	33 2
	Welsh (Stores)	39	3 1	24 8	11	3 5	27 4	—	—	—
	West Highland (Stores)	24	3 0½	24 6	29	3 9	30 0	31	4 9	38 0

* Sold by Live Weight.

ENGLAND and SCOTLAND, as received from the Market Authorities in the (Weighing of Cattle) Act, 1891 (54 & 55 Vict. c. 70.).

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.		Animals Weighed.	Average Price.	
			Per Stone.	Per Cwt.		Per Stone.	Per Cwt.		Per Stone.	Per Cwt.
SCOTLAND: Aberdeen	Cross Bred -	No. 808	s. d. 2 10	s. d. 22 8	No. 1,919	s. d. 3 11 $\frac{3}{4}$	s. d. 31 10	No. 1,155	s. d. 4 5 $\frac{1}{2}$	s. d. 35 8
	Cross Bred* -	—	—	—	—	—	—	2	4 6	36 0
	Polled -	72	3 0 $\frac{1}{2}$	24 6	109	4 0 $\frac{1}{2}$	32 6	151	4 7	36 8
	Polled Angus -	51	3 2 $\frac{1}{2}$	25 10	156	4 4 $\frac{1}{2}$	35 0	8	5 8	45 4
	Cross Bred (Stores) -	—	—	—	10	4 1 $\frac{1}{2}$	33 2	—	—	—
	Irish (Stores) -	—	—	—	256	3 3	26 0	—	—	—
	Irish (Stores) -	—	—	—	—	—	—	—	—	—
Dundee	Cross Bred -	—	—	—	—	—	—	10	4 2	33 4
	Cross Bred Polled -	11	3 2 $\frac{3}{4}$	25 10	185	3 11 $\frac{1}{2}$	31 8	217	4 3	34 0
	Cross Bred Polled* -	—	—	—	2	4 0	32 0	74	4 2 $\frac{3}{4}$	33 10
	Cross Bred Short-horns -	46	3 2 $\frac{3}{4}$	25 10	172	3 11	31 4	137	4 2 $\frac{1}{2}$	33 8
	Cross Bred Short-horns* -	—	—	—	11	4 0	32 0	15	4 2 $\frac{1}{2}$	33 6
	Irish Cross Bred -	49	2 11 $\frac{1}{2}$	23 8	615	3 11 $\frac{1}{2}$	31 8	575	4 2 $\frac{3}{4}$	33 10
	Irish Cross Bred* -	1	2 7 $\frac{1}{2}$	21 0	2	3 9	30 0	75	4 2 $\frac{3}{4}$	33 10
	Polled Angus -	—	—	—	—	—	—	15	4 4	34 8
	Polled Angus* -	2	3 9	30 0	—	—	—	—	—	—
	West Highland -	5	3 9 $\frac{3}{4}$	30 6	54	4 0	32 0	68	4 4 $\frac{1}{2}$	34 10
	West Highland* -	—	—	—	—	—	—	14	4 5 $\frac{1}{2}$	35 8
	Irish (Stores) -	—	—	—	—	—	—	9	3 11 $\frac{1}{2}$	31 6
Edinburgh	Cross Bred -	—	—	—	3,126	4 0 $\frac{1}{2}$	32 6	—	—	—
	Irish Shorthorns* -	—	—	—	13	3 9	30 0	—	—	—
	Polled Angus -	—	—	—	2	3 10 $\frac{1}{2}$	31 2	4	4 1 $\frac{1}{2}$	32 10
	Polled Galloways -	—	—	—	4	4 0 $\frac{1}{2}$	32 4	4	4 5	35 4
	Polled Galloways* -	—	—	—	—	—	—	8	4 9	39 0
	Shorthorns -	—	—	—	24	3 8 $\frac{1}{2}$	29 10	46	4 2 $\frac{1}{2}$	33 6
	Shorthorns* -	—	—	—	9	3 9	30 0	12	4 5	35 4
	West Highland -	—	—	—	—	—	—	15	4 4 $\frac{1}{2}$	35 0
	West Highland* -	—	—	—	—	—	—	39	4 9	38 0
	Irish Shorthorns (Stores) -	—	—	—	77	3 7	28 8	—	—	—
	Irish Shorthorns (Stores)* -	—	—	—	24	3 2	25 4	—	—	—
	Irish Shorthorns (Stores)* -	—	—	—	—	—	—	—	—	—
Perth	Cross Bred -	15	3 8 $\frac{1}{2}$	29 6	24	3 11	31 4	16	4 4	34 8
	Cross Bred Polled -	106	3 9 $\frac{1}{2}$	30 2	203	4 0 $\frac{1}{2}$	32 2	144	4 2 $\frac{1}{2}$	33 10
	Cross Bred Short-horns -	—	—	—	2	3 11 $\frac{1}{2}$	31 8	—	—	—
	Polled Angus -	—	—	—	2	3 11 $\frac{1}{2}$	31 8	58	4 5 $\frac{1}{2}$	35 6
	West Highland -	5	3 7 $\frac{1}{2}$	28 10	—	—	—	—	—	—

* Sold by Live Weight.

The number and prices of Sheep reported as weighed under the Markets and Fairs (Weighing of Cattle) Act, 1891, in the under-mentioned places in the Fourth Quarter of 1894 are shown in the following table:—

PLACES.	BREED OR CLASS.	INFERIOR. (3rd Quality.)			GOOD. (2nd Quality.)			PRIME. (1st Quality.)		
		Animals		Average Price.	Animals		Average Price.	Animals		Average Price.
		Weighed.	Per Stone.	Per Cwt.	Weighed.	Per Stone.	Per Cwt.	Weighed.	Per Stone.	Per Cwt.
ENGLAND:		No.	s. d.	s. d.	No.	s. d.	s. d.	No.	s. d.	s. d.
Liverpool	Irish Cross Bred	—	—	—	287	5 4½	43 2	—	—	—
London	Downs	—	—	—	34	5 6	44 0	10	5 9½	43 6
	Downs*	—	—	—	—	—	—	15	6 0	48 0
	Half Bred	—	—	—	5	5 4	42 8	—	—	—
	Half Bred*	—	—	—	35	5 3	42 0	—	—	—
SCOTLAND:										
Aberdeen	Black Face Wethers	—	—	—	—	—	—	72	4 2½	33 10
	Cheviot Wethers	—	—	—	—	—	—	88	4 2½	33 6
	Cross Bred	—	—	—	1,103	3 10½	30 10	1,108	4 7	33 8
	Cross Bred Hogs	—	—	—	—	—	—	210	4 9½	38 2
	Half Bred Hogs	—	—	—	—	—	—	20	4 7½	36 10
Dundee	Cross Bred Hogs	—	—	—	—	—	—	40	4 2½	33 10
Perth	Black Face Wethers	—	—	—	103	4 4½	35 0	98	4 9½	38 6
	Black Face Hogs	—	—	—	20	4 5	35 4	—	—	—
	Black Face Ewes	104	3 0	24 0	112	3 8½	29 8	—	—	—
	Cheviots	—	—	—	—	—	—	20	4 10½	39 2
	Cheviot Hogs	—	—	—	—	—	—	28	5 0	40 0
	Cross Bred Hogs	60	4 2	33 4	142	4 6½	36 4	82½	4 9½	38 2
	Cross Bred Hoggets	—	—	—	65	4 10	38 8	—	—	—
	Cross Bred Ewes	27	3 5½	27 6	—	—	—	—	—	—
	Half Bred Hogs	—	—	—	—	—	—	19	4 10½	39 0
	Half Bred Hoggets	—	—	—	30	4 9	38 0	40	4 11½	39 6
	Half Bred Ewes	37	3 2½	25 8	—	—	—	—	—	—

* Sold by Live Weight.

XIII.—PARLIAMENTARY PUBLICATIONS DEALING WITH AGRICULTURE.

Agricultural Statistics, Ireland.—Tables showing the Extent in Statute Acres and the Produce of the Crops for the Year 1894; together with Tables showing the Average Yearly Extent under the Principal Crops, and the Average Produce thereof in the Ten Years 1884–93; also Bee Keeping Statistics for the Season 1893. [C.-7532.] Price 3½d.

This report of the Registrar-General for Ireland contains very complete statistical details, showing by counties and by provinces the extent of land under crops in Ireland in 1894. It also gives the observations of the inspectors of the Royal Irish Constabulary and of the sergeants of the Metropolitan Police, who acted as superintendents of the agricultural statistics.

Comparing the area under the several cereal crops in 1894 with that for 1893, there is a decrease of 5,660, or 10·3 per cent., in the number of acres under wheat; a decrease of 4,181 acres, or 2·5 per cent., in barley; a decrease from 195 to 176 acres in bere; and a decrease of 1,535 acres, or 11·4 per cent., under rye; with an increase of 6,499 acres, or 0·5 per cent., in oats. In green crops, potatoes decreased by 6,645 acres, or 0·9 per cent., turnips increased by 8,536 acres, or 2·8 per cent., and mangel wurzel and beetroot increased by 5,005 acres, or 10·6 per cent. In other crops—flax increased by 33,594 acres, or 49·8 per cent.; meadow or clover, sainfoin, and grasses under rotation decreased by 1,297 acres, or 0·2 per cent.; while meadow on permanent pasture or grass not broken up in rotation, increased by 16,422 acres, or 1·1 per cent. Compared with the average acreage for the 10 years 1884–93 turnips increased by 12,156 acres, or 4·1 per cent., mangel wurzel and beetroot by 8,295 acres, or 19·0 per cent., flax by 1,830 acres, or 1·8 per cent., and hay by 71,775 acres, or 3·4 per cent. Wheat shows a decrease compared with the average of 26,463 acres, or 34·5 per cent.; in oats there is a decrease of 19,678 acres, or 1·5 per cent.; in barley a decrease of 10,470 acres, or 6·0 per cent.; the area under bere declined from 343 acres to 176 acres, and rye decreased 196 acres, or 1·6 per cent. Potatoes have decreased by 61,182 acres, or 7·9 per cent.

The average yield per acre of cereal crops in 1894, compared with 1893, exhibits an increase in wheat of 0·4 cwt., and in barley of 0·7 twt., while there is a decrease in oats of 0·1 cwt. in bere of 0·3 cwt., and in rye of 0·5 cwt. In other crops—potatoes show a decrease of 1·6 tons, turnips of 2·3 tons, mangel

wurzel and beet of 1·7 tons, and flax of 2·5 stones. Hay from clover, sainfoin, and grasses under rotation, shows an increase of 0·4 ton, and hay from permanent pasture or grass not broken up in rotation, an increase of 0·4 ton. The rates for 1894 compared with the average rates for the 10 years 1884–93 show for cereal crops an increase in wheat of 1·2 cwts., in oats of 1·3 cwts., in barley of 0·9 cwt., and in rye of 0·2 cwt., with a decrease in bere of 0·4 cwt. In other crops there is an increase in turnips of 0·8 ton, in mangel wurzel and beetroot of 0·7 ton, and in flax of 6·0 stones. In potatoes there is a decrease of 1·0 ton. The rate for hay is 0·3 ton over the average.

The total produce of wheat in 1894 was 820,490 cwts., being 8·0 per cent. under the produce for the preceding year, and 30·5 per cent. under the average for the 10 years 1884–93; the total quantity of oats was 19,290,996 cwts., being 0·5 per cent. under the produce in 1893, but 7·7 per cent. over the average for the 10 years 1884–93; the quantity of barley was 2,812,679 cwts., being an increase of 1·5 per cent. as compared with the return in 1893, but 0·8 per cent. below the average for the 10 years 1884–93; bere yielded 2,307 cwts. against 2,619 cwts. in 1893, and an average of 4,627 cwts. for the 10 years 1884–93; and the produce of rye was 151,790 cwts., being 14·8 per cent. below that for the preceding year, but 0·6 per cent. above the average for the 10 years 1884–93.

The total produce of potatoes was 1,873,164 tons, being 38·9 per cent. below the yield in 1893, a decrease equivalent to 33·9 per cent. as compared with the average produce for the 10 years 1884–93.

The turnip crop was 4,279,494 tons, being 11·7 per cent. under the produce in 1893, but 11·1 per cent. above the average for the 10 preceding years; and the total quantity of mangel wurzel and beetroot was 758,192 tons, being 1·4 per cent. less than in 1893, but 24·3 per cent. over the average for the 10 years 1884–93.

Flax yielded 21,508 tons, being 39·8 per cent. over the produce in 1893, and 23·8 per cent. above the average quantity for the 10 years 1884–93.

The produce of hay from clover, sainfoin, and grasses under rotation was 1,494,025 tons, showing an increase equal to 19·6 per cent. as compared with the quantity in 1893, and the hay from permanent pasture and grass not broken up in rotation amounted to 3,815,339 tons, or 18·0 per cent. in excess of such produce in 1893. The aggregate quantity of hay under both headings (5,309,364 tons) is 826,077 tons, or 18·4 per cent. over that for 1893, and shows an increase equivalent to 20·8 per cent. as compared with the average produce for the 10 years 1884–93.

The following statement is given in the report, showing to

what extent different varieties of potatoes were grown in Ireland in 1894:—

—	Acres.	Per Cent.	—	Acres.	Per Cent.
Champions -	562,674	78·5	American Roses -	3,683	} 4·0
Flounders -	54,685	7·6	Cruffles -	2,292	
Magnum Bonums -	17,663	2·5	Brown Rocks -	1,671	
Irish Whites -	17,257	2·4	Leather Coats -	982	
Skerry Blues -	14,778	2·1	Green Tops -	283	
White Rocks -	9,896	1·4	Red Rocks -	101	
Kemps -	6,390	0·9	American Whites -	57	
Scotch Downs -	4,734	0·6	All others -	19,944	

The main feature observable in the foregoing statement is that 78·5 per cent. of the acreage under the potato crop in Ireland consists of Champions, leaving only 21·5 per cent. for all other varieties—the per-centage of some of these being so small as to be barely appreciable when put into figures.

The Champion potato was first introduced in quantity into Ireland in the year 1880, after the failure of the crop in 1879. Since that year it has constituted the main potato crop of the country, and figures are given to show that the proportion of Champions planted in Ireland has practically been the same for many years past.

The report also contains the following table, showing for each of the nine years 1885–93 the quantity of honey produced in Ireland, distinguishing the quantity produced in hives having movable combs from that produced in other hives, and run honey from section honey:—

Years.	Honey Produced.						
	In Hives having Movable Combs.			In other Hives.			General Total.
	Run.	Section.	Total.	Run.	Section.	Total.	
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1885 -	46,196	59,218	105,414	141,285	55,598	196,883	302,297
1886 -	52,609	74,332	126,941	145,132	59,094	204,226	331,167
1887 -	77,897	134,357	212,254	188,951	58,181	247,132	459,386
1888 -	55,788	92,653	148,441	137,301	42,350	179,651	328,092
1889 -	74,942	143,566	218,508	152,104	53,976	206,080	424,588
1890 -	47,952	86,136	134,088	115,599	42,429	158,028	292,116
1891 -	43,087	91,561	134,648	88,909	30,004	118,913	253,561
1892 -	34,707	69,629	104,336	66,733	21,388	88,121	192,457
1893 -	40,900	91,413	132,313	81,685	34,365	116,050	248,363

Local Taxation Returns (England). The Annual Local Taxation Returns for the Financial Year 1892-93, Part II.
[H.C. 295.] Price 6½d.

This publication of the Local Government Board contains abstracts of the accounts of the county councils (other than the London County Council) and joint committees of such councils, as well as the accounts of pauper lunatic asylums other than those belonging to the county and city of London.

The accounts show that the expenditure of the councils during the year, excluding that defrayed out of loans, amounted to 6,624,089*l.* It was 204,924*l.* less than the receipts from sources other than loans for the year (6,829,013*l.*), and 749,158*l.* more than the corresponding expenditure for the preceding year (5,874,931*l.*). The excess of receipts over expenditure during the year was mainly attributable to the fact that large sums were shown as received during the year from other local authorities which were not expended during the year, and that while the transfers from the Exchequer Contribution accounts of the councils to the technical and intermediate education accounts under section I. of the Local Taxation (Customs and Excise) Act, 1890, amounted to 454,170*l.*, the expenditure of the councils on technical and intermediate education was 351,881*l.* The excess of the total expenditure of the councils over that of the preceding year was attributable partly to increases, amounting to no less than 238,721*l.*, in the expenditure on main roads and contributions to roads not being main roads. There were also large increases in the expenditure in respect of technical education, of police, and in the amounts paid to other local authorities.

The expenditure of the county councils under the Contagious Diseases (Animals) Acts in 1892-93 was only 31,368*l.*, or about the same as in the preceding year, when it was 31,138*l.* These amounts, however, show a significant reduction when compared with the sums expended under this head by the local authorities in previous years, viz., 99,701*l.* in 1890-91, 84,542*l.* in 1889-90, and 117,328*l.* in 1888-89.

Local Taxation Returns (Scotland). The Annual Local Taxation Returns for the Year 1892-3. [H.C. 303.]
Price 1*s.* 6*d.*

This volume is the thirteenth Annual Return under the Local Taxation Returns (Scotland) Act, 1881, and contains abstracts of the receipts and expenditure of the various local authorities of Scotland for the year 1892-3.

The amount shown in the return as having been received by the local authorities of Scotland during the year was 7,550,124*l.*; of which 3,779,525*l.* was obtained by means of rates; 1,111,275*l.* is attributable to tolls, dues, duties, fees, fines, and rents of

corporate property; 1,356,619*l.* was received from grants in aid of local taxation; and 1,302,705*l.* was contributed from various other sources.

The total expenditure of the local authorities during the year was 8,119,831*l.*, which shows an increase of 1,337,819*l.* on that of the previous year. The amount of loans outstanding at the beginning of the year was 27,571,345*l.*; there was borrowed during the year, on security of rates, dues, or property, 2,257,726*l.*; and 1,533,274*l.* was expended in repayment of money borrowed. The amount of debt has, therefore, been increased by 724,452*l.* The interest paid during the year amounted to about 1,028,459*l.* Including the amounts borrowed and repaid during the year, the total receipts were 9,807,850*l.*, and the total expenditure 9,653,105*l.*

The return also contains tables showing the rate per £ (*a*) of assessment falling upon owners and occupiers in each rating area, and (*b*) of assessments (other than Public Health assessment) levied by county councils in Scotland in the year ended 15th May 1893.

*Local Taxation Returns (Ireland). Returns of Local Taxation in Ireland for the Year 1893. Collected and compiled under the direction of the Local Government Board by desire of His Excellency the Lord Lieutenant of Ireland. [C.—7499.] Price 5½*d.**

It is stated in this publication that the local taxation of Ireland, after making the deductions necessary on account of sums which appear twice in the receipts of local authorities consequent on the fact that contributions are sometimes made from the taxation of one local authority towards the expenditure of another, may be set down for the year 1893 at 3,697,949*l.*, being an increase of 107,710*l.*, or 3 per cent. on the amount in the previous year.

Information is also given in the report regarding dog licences, burial boards, poor rates, drainage, &c.

*Royal Commission on Agriculture. Minutes of Evidence with Appendices. Vol. II. [C.—7400.—II.] Price 6*s.**

This volume contains the evidence of 44 witnesses who were examined by the Royal Commission on Agriculture between the 29th March 1894 and the 27th July 1894. An index to the evidence is also given together with five appendices. Appendix A. consists of various statements handed in by the witnesses. Appendix B. consists of tables showing the quantities of imports into the United Kingdom, from 1874 to 1893 inclusive, of wheat,

wheatmeal and flour, barley, oats, and maize. Appendix C. contains a statement showing the number of persons engaged in agricultural occupations in Great Britain according to the Census Returns of 1871, 1881, and 1891. Appendix D. gives an account of the gross assessments under Schedules A., B., and D., in each county of Great Britain for each of the years 1874-75, 1879-80, and 1892-93. Appendix E. is a statement showing the rates of freight on certain articles at various dates.

Woods and Forests. The Seventy-second Report of the Commissioners of Her Majesty's Woods, Forests, and Land Revenues, in obedience to the Acts of 10 Geo. IV. (Cap. 50), and 2. Will. IV. (Cap. 1); being the Forty-third Report under the Act of the 14 & 15 Vict. (Cap. 42.) [H.C. 194.] Price 1s. 5½d.

This volume contains the Forty-third Report of the Commissioner in charge of the land revenues of the Crown in England, under a warrant of the Lords Commissioners of Her Majesty's Treasury, dated 13th November 1893.

It relates to the Crown estates, which include (1.) Windsor Great Park, and certain property in the neighbourhood; and (2.) various manors, messuages, land, fee-farm rents, &c., in various parts of England.

The property described under the first head consists of more than 14,000 acres, of which about 2,650 (including about 800 acres used in connexion with the Forest Classes held at Cooper's Hill College) are let to tenants, and the remainder is in hand, being either planted and under the growth of timber, heathland, or pasture in the park.

Under the second head, are included about 70,000 acres of land appropriated to agricultural purposes, of which about 2,487 acres remain in hand for want of suitable tenants, viz., a farm consisting of 323½ acres in Bedfordshire; two farms comprising together 1,027½ acres in Oxfordshire; a tract of grass land containing 357 acres at Wingland, in Lincolnshire; another area of grass land of about 207 acres in the Isle of Sheppey, in Kent; and a farm comprising about 572 acres in Suffolk.

The report contains numerous appendices and a copious index.

Report from the Select Committee on Land Acts (Ireland), together with the proceedings of the Committee, Minutes of Evidence, Appendix, and Index. [H.C. 310.] Price 7s. 3d.

This publication contains the Report of the Select Committee appointed to inquire and report upon the principles and practice of the Irish Land Commissioners and County Court Judges in carrying out the fair rent and free sale provisions of the Land Acts of 1870, 1881, and 1887, and of the Redemption of Rent Act of 1891, and to suggest such improvements in law or practice as they may deem to be desirable.

Weights and Measures. Report by the Board of Trade on their Proceedings and Business under the Weights and Measures Acts, 1878 and 1889. [H.C.-254.] Price 2½d.

This report is made under the 33rd section of the Weights and Measures Act, 1878, and contains, *inter alia*, a list of counties, cities, and boroughs, for which local standards have been verified or re-verified by the Board of Trade, or locally compared, during the twelve months ending 2nd August 1894; of the local authorities who have made general regulations for the guidance of their Inspectors of Weights and Measures; and of the inspectors authorised since 3rd August 1893 to adjust weights and measures in pursuance of the 12th section of the Weights and Measures Act, 1889.

It is stated in the report that from a Bulletin (No. 26, dated 5th April 1893), issued by the United States Coast and Geodetic Survey, Washington, with the approval of the Secretary of the United States Treasury, in future the "International Prototype Metre and Kilogramme" (deposited at Paris) will be regarded in the United States as the fundamental standards of "Length and Mass," and that the Yard and Pound in America will be derived from these metric standards.

Congested Districts Board for Ireland. Third Report of the Congested Districts Board for Ireland, for the period from the 1st January 1894 to the 31st March 1894. [C.-7522.] Price 1s. 5d.

This report relates to the first three months of the year only in order that future reports may end with the ordinary financial year.

The agricultural section of the report contains information relating to the occupiers of small holdings in various districts, and to the administration of the French estate in county Galway.

A few tons of seed oats purchased in Scotland were sold to small occupiers of land in the Kilerohane district, county Cork.

It is believed that good results will follow from the introduction of the new seed, and the Board hope to extend the sale of seeds and also of suitable artificial manures to small occupiers in other districts where the means are defective for obtaining and selling such articles of good quality at moderate prices.

The Board have also taken further steps for obtaining information as to the establishment of market gardening as an industry in suitable places in the congested districts.

Arrangements are in progress for the establishment of small poultry farms in additional districts during the autumn and early winter of 1894.

A grant of 100*l.* was made for experiments to encourage the keeping of bees by small occupiers of land, and the operations under this grant are being conducted on the system approved by the best authorities on the subject.

The report states that the efforts of the Hon. Horace Plunkett, one of the members of the Board, in the advancement of co-operative dairying are well known. In consideration of the very favourable position of the numerous co-operative creameries established by or in consultation with him, the sum of 250*l.* was voted by the Board towards promoting in congested districts the objects of the Irish Agricultural Organisation Society, of which Mr. Plunkett is president.

Administration Report on the Railways in India for 1893-4, by Lieutenant-Colonel W. S. S. Bisset, C.I.E., R.E., officiating Director-General of Railways. [C.-7453.] Price 2s. 9d. ;

In the section of this report giving the details of the revenue of the Indian railways it is stated that in 1893 the grain and seeds traffic, which forms the most important freight on Indian railways, showed an increase, compared with the preceding year, of 530,141 tons, or 7·61 per cent., the actual figures being 7,495,469 tons in 1893, compared with 6,965,328 tons in 1892.

In wheat alone, the total traffic over the entire system of standard and metre gauge railways amounted to 987,791 tons in 1893, compared with 1,186,374 tons in 1892.

The quantities of wheat carried by the important exporting railways during the seven years 1886-92 were as follows:— 920,679 tons in 1886, 964,428 tons in 1887, 1,175,231 tons in 1888, 956,239 tons in 1889, 931,789 tons in 1890, 1,881,545 tons in 1891, and 1,230,823 tons in 1892.

The exports of wheat from the three chief ports during the same period are given in the following table, which also shows the per-centage of exports on the estimated out-turn of wheat

in the financial year ending on the 31st March of the calendar year for which the export figures are given :—

Ports.	1887.	1888.	1889.	1890.	1891.	1892.	1893.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bombay - -	468,861	489,823	310,365	291,821	661,186	483,075	256,324
Calcutta - -	231,715	149,446	78,900	67,223	220,207	180,151	54,349
Kurrachee - -	35,621	153,479	348,727	332,508	524,809	263,376	263,923
Total -	736,197	792,748	738,192	681,552	1,406,202	926,602	574,596
	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.
Estimated out-turn of wheat in India during each pre- vious financial year in tons -	6,417,078	7,014,896	6,357,074	6,123,000	6,876,000	5,535,000	7,149,000
Per-centage of ex- ports on out-turn }	11·47	11·30	11·61	11·13	20·45	16·74	8·04

The large decrease in 1893, as compared with the two previous years, is due to a heavy falling off in the demand for export. It must, however, be borne in mind that the figures for the out-turn are only estimates, which are liable to considerable deviation from actuals.

XIV.—IMPORTS AND EXPORTS OF AGRICULTURAL PRODUCE IN 1894.

IMPORTS OF LIVE ANIMALS AND DEAD MEAT.

The returns furnished weekly by Her Majesty's Customs to the Board of Agriculture show that the imports of cattle last year exceeded those of 1893 by 135,000 head, or 40 per cent., and that the sheep imported into the United Kingdom were nearly eight times as numerous as in the previous year, as will be seen from the table below:—

Countries from which exported.	Cattle.		Sheep.	
	52 Weeks ended December 30, 1893.	52 Weeks ended December 29, 1894.	52 Weeks ended December 30, 1893.	52 Weeks ended December 29, 1894.
	No.	No.	No.	No.
United States - - -	248,766	381,241	—	193,837
Canada - - -	82,935	82,326	3,590	136,692
Argentine Republic - - -	6,884	9,546	22,372	73,442
Channel Islands - - -	1,301	1,603	—	—
New South Wales - - -	—	36	—	42
Iceland - - -	—	—	29,249	65,524
Norway - - -	41	3	6,807	10,837
Chili - - -	—	—	694	—
	339,927	474,755	62,712	480,374

The increased receipts of cattle were practically accounted for by the augmentation in the numbers received from the United States, but the total was nevertheless below the entries of any single year of the period 1889–1892. The imports of Canadian cattle were practically the same as in 1893. The entry of 9,546 live cattle from the Argentine Republic formed the largest importation yet recorded from this quarter, and an entirely novel feature of the import trade in cattle was the entry into the United Kingdom of 36 live cattle from New South Wales in 1894.

As regards the importation of live sheep, the number received in the past 12 months exceeded the importation of any single year since 1889. The importation has mainly come from the United States and Canada, representing a larger arrival than has before been credited to transatlantic countries. On

one occasion, in 1879, 119,350 head of sheep were received from United States ports, but recently the sheep from this quarter have not reached a tenth of that total. In the past year, 194,000 were received from the United States. The importation of 136,692 Canadian sheep is also by far the largest entry of live sheep from Canada recorded by the Customs. In 1883 and 1886, the Dominion sent 94,286 and 94,356 head respectively of our imports of sheep, but since the year last mentioned, the arrivals of Canadian sheep have never exceeded 56,000 head. There has been a remarkable increase in the trade in sheep from Argentina, which was more than three times greater than in 1893. This export would appear to have sprung into importance in 1890, when 22,000 Argentine sheep reached our ports. But for the next three years, there was no augmentation in the supply. In 1892, the total fell to 14,550 head, and in 1891 and 1893, our imports of Argentine sheep were 20,941 and 22,372 head respectively. The imports of sheep from Iceland in 1894 were more than double those of 1893.

The following table shows that the quantity of fresh meat imported into the United Kingdom in 1894 was about 15 per cent. in excess of the receipts in 1893, the increase having been about equally divided between beef and mutton:—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Beef - - - -	1,808,051	2,104,094	3,830,596	4,213,671
Mutton - - - -	1,971,500	2,295,065	3,873,863	4,341,227
Pork - - - -	182,091	180,383	455,544	436,546
Rabbits - - - -	103,823	108,476	287,737	296,918
Total - - - -	4,065,465	4,688,018	8,447,740	9,228,362

In beef, it was again the increased entries from the United States which almost entirely accounted for the larger entries. Australasian mutton has again increased in quantity, the receipts from this source in 1894 having been 1,439,000 cwts. as compared with 1,187,000 cwts. in 1893, and 977,000 cwts. in the previous year. Argentine mutton also entered our ports in larger quantities during the past 12 months than in either of the two previous years, the quantities being 586,000 cwts., as against 516,000 cwts. in 1893 and 471,000 cwts. in 1892. There was a slight decrease in the importation of fresh pork, while the imports of rabbits, on the other hand, exhibited a slight augmentation.

The quantities and values of the imports of salted and preserved meat are given below:—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Salted beef - - -	200,514	242,311	278,997	342,814
„ pork - - -	186,901	225,119	289,577	336,556
Bacon - - -	3,198,887	3,716,603	8,479,815	8,083,987
Hams - - -	988,411	1,129,784	2,890,252	2,771,828
Meat, preserved, otherwise than by salting (chiefly canned).	590,800	554,346	1,545,211	1,490,002
Meat, unenumerated, salted or fresh.	177,509	189,757	399,912	410,724
Total - - -	5,343,022	6,057,920	13,883,164	13,435,911

The imports both of salt beef and salt pork in the 12 months ending December last showed an increase as compared with the receipts of 1893, but a decrease as compared with those of 1892. The bacon imports of 1894 were 518,000 cwts. in excess of those of the previous year, but 165,000 cwts. short of those of 1892. The increase as compared with 1893 was largely made up of augmented receipts from Denmark, Canada, and the United States. The first-mentioned country was responsible for 766,000 cwts. of the imports of bacon in 1894, this representing an increase in the receipts of Danish bacon of 55,000 cwts. as compared with 1893, and 95,000 cwts. as compared with 1892. Comparing 1894 with 1893, Canada is credited with an increase of 60,000 cwts. in her shipments of bacon to the United Kingdom, but the imports of Canadian bacon in 1893 were 45,000 cwts. less than those of the previous year. From the United States 2,561,000 cwts. were received in 1894 as compared with 2,177,000 in 1893 and 2,896,000 cwts. in 1892.

IMPORTS OF DAIRY PRODUCE, EGGS, AND LARD.

The imports of dairy produce, eggs, and lard in 1894 and the previous year are shown in the table below :—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Butter - - -	2,327,474	2,576,063	12,753,593	13,470,419
Margarine - - -	1,299,970	1,109,313	3,655,344	3,044,781
Cheese - - -	2,077,462	2,263,287	5,160,918	5,467,137
Lard - - -	1,118,106	1,400,516	2,808,549	2,758,416
Condensed milk - - -	501,005	529,560	1,009,755	1,079,425
	Great Hundred.	Great Hundred.		
Eggs - - -	11,045,986	11,876,968	3,875,647	3,786,320

BUTTER.

The import trade in butter for 1894 showed a continuation of the steady increase in the importation of this article into the United Kingdom, which has been a feature of our trade returns for the past seven years. From the following table it will be observed that Denmark increased her shipments of butter to this country, there having been an increase of 168,000 cwts. from this source in 1894 as compared with 1893. The augmented supplies received from other countries may be largely accounted for by heavier shipments from Australasia. In 1894, butter was imported from Australasia to the extent of 301,000 cwts., as against 169,000 cwts. in the previous 12 months.

Butter.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
From Denmark - - -	934,787	1,102,493	5,278,875	5,843,954
„ France - - -	468,317	424,639	2,679,120	2,351,839
„ Sweden - - -	267,401	266,306	1,452,099	1,413,779
„ other countries - -	656,969	782,625	3,343,499	3,860,847
Total - - -	2,327,474	2,576,063	12,753,593	13,470,419

CHEESE.

The countries from which the bulk of the cheese was imported are distinguished for both years below.

Cheese.	Quantities.		Values.	
	1893.	1894.	1893	1894.
	Cwts.	Cwts.	£	£
From United States - -	645,235	672,347	1,578,531	1,608,405
„ Canada - - -	1,046,704	1,142,104	2,575,893	2,688,946
„ Holland - - -	269,364	298,693	676,001	760,838
„ other countries - -	116,159	150,143	330,493	408,948
Total - - -	2,077,462	2,263,287	5,160,918	5,467,137

EXPORTS OF BUTTER AND CHEESE.

It is not always remembered that there is a small export both of British and Irish dairy produce, and also a re-export of foreign commodities of this class, shown in the Trade and Navigation Returns, which can be set, so far as they go, against the large importations above recorded. These shipments of butter and cheese, which are shown below, reduced the United Kingdom's

net account for imported foreign dairy produce by over half-a-million sterling in 1894.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Butter :—Home - - - -	14,640	17,159	85,936	98,455
„ Foreign - - - -	65,924	58,354	372,873	311,791
Cheese :—Home - - - -	10,917	10,194	44,051	39,794
„ Foreign - - - -	63,095	55,932	195,696	168,067

EGGS.

The imports of eggs in 1894 exceeded those of the previous year by 800,000 great hundreds. This increased importation was, however, accompanied by a considerable change in the sources of supply. A great falling off was recorded in the receipts of eggs from French ports, but this was more than counter-balanced by augmented arrivals from Germany and Belgium. There was a decline in the entries of eggs from Russia and a slight increase in the receipts of Danish eggs.

Eggs.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Great Hundreds.	Great Hundreds.	£	£
From Germany - - - -	2,129,154	3,361,188	618,631	937,078
„ Belgium - - - -	2,040,692	2,954,843	682,636	885,136
„ France - - - -	3,820,636	2,440,559	1,611,495	982,800
„ other countries - - -	3,055,504	3,120,378	962,885	981,306
Total - - - -	11,045,986	11,876,968	3,875,647	3,786,320

IMPORTS AND EXPORTS OF WOOL.

The figures for 1894 show an increase over those of 1893 of 27,000,000 lbs. in the importation of sheeps and lambs' wool, but the receipts of last year were nearly 40,000,000 lbs. below those of 1892. It will be seen from the following table that the receipts of Australasian wool exceeded those of 1893 by about 30,000,000 lbs., but the importation in the year last mentioned was some 40,000,000 lbs. below that of the previous twelve months. The imports of Indian wool exceeded those of 1893 by over 8,000,000 lbs., while the receipts of South African wool in 1894 were 18 per cent. under those of 1893.

Wool.	Quantities.		Value.	
	1893.	1894.	1893.	1894.
	Lbs.	Lbs.	£	£
From Australasia -	472,367,169	502,202,500	17,463,013	18,040,107
„ Countries in Europe.	43,045,924	43,487,283	1,611,345	1,692,380
„ British Possessions in South Africa.	84,650,636	69,348,730	3,281,099	2,743,802
„ British East Indies	32,804,874	41,156,812	944,320	1,136,240
„ other countries -	39,894,671	43,309,347	1,139,121	1,178,631
	672,763,274	699,504,672	24,438,898	24,791,160

The exports of British wool in 1894 were about 19 per cent. below the shipments of 1893, and about 28 per cent. below those of 1892, when the exports of home-grown sheep and lambs' wool from the United Kingdom amounted to 18,000,000 lbs. The falling-off has been principally in respect of shipments to the United States.

The quantity of foreign wool re-exported was nearly the same in 1894 as in 1893.

Wool, sheep and lambs'.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Lbs.	Lbs.	£	£
To Germany:				
Home -	3,122,900	2,276,900	143,377	102,785
Foreign -	85,450,797	104,455,535	3,575,577	4,586,806
„ Holland:				
Home -	1,456,700	1,322,400	61,865	55,456
Foreign -	51,325,401	31,691,205	1,855,855	1,214,418
„ Belgium:				
Home -	967,100	406,000	42,185	17,624
Foreign -	76,047,490	66,173,806	2,969,904	2,677,113
„ France:				
Home -	1,299,400	1,005,300	58,384	42,204
Foreign -	75,708,776	86,816,834	2,969,607	3,239,061
„ United States:				
Home -	7,210,500	5,898,000	223,962	162,761
Foreign -	52,686,306	53,003,894	1,733,700	1,641,168
„ British North America:				
Home -	580,400	346,000	22,310	14,317
Foreign -	—	—	—	—
„ other countries:				
Home -	1,412,900	1,743,500	82,192	96,489
Foreign -	4,574,841	2,808,207	189,123	116,482
Total { Home	16,049,900	12,998,100	634,275	491,636
Foreign	345,793,611	344,949,481	13,293,766	13,475,048

IMPORTS AND EXPORTS OF HORSES.

The importation of horses for each of the years 1893 and 1894, as shown in the December number of the monthly Trade and Navigation Returns, was as under:—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	No.	No.	£	£
Stallions - - -	505	791	80,270	31,638
Mares - - -	2,980	5,127	60,865	124,978
Geldings - - -	10,222	16,948	235,684	391,442
Total - - -	13,707	22,866	376,819	548,058

The imports of horses in 1894 exceeded those of the previous year by 9,000 head, but a comparison with 1892 would show an increase of 2,000 head only. The augmentation in the number of mares imported is mainly accounted for by an increase in the number received from the United States and Canada. In the 12 months ended December last, 1,234 mares were imported from the former country as compared with 184 in the previous year, and 97 in 1892. From Canada, 1,095 mares were received in 1894, while in the previous year the number of Canadian mares imported was 354, and in 1892 only 93. The increased entries of geldings are, also, to a large extent, accounted for by larger importations from the United States and Canada. The total number of geldings received from these two countries having been 7,800 in 1894, as against 2,500 in 1893 and 2,600 in 1892. The falling off in the importation of geldings from Germany has continued, the number received in the 12 months to December last having been 3,838 as compared with 4,737 in the previous 12 months and 9,920 in 1892.

From the following table, which shows the exports of horses, it will be seen that there was an increase of 4,700 in the number of geldings shipped from the United Kingdom in 1894 as compared with the exports of the previous year. This is to be accounted for chiefly by the larger demands from Holland, Belgium, and France. In 1892, the export of geldings represented a total of 7,348 head, of which 6,896 were shipped to the three countries named; in 1893 the shipments to these countries amounted to 8,084 head, and to 12,879 head in 1894.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	No.	No.	£	£
Stallions - - -	501	366	86,058	53,620
Mares - - -	2,882	2,885	169,693	147,205
Geldings - - -	8,578	13,307	217,011	247,640
Total - - -	11,961	16,558	472,762	448,465

HAY AND STRAW IMPORTS IN 1894.

The importation of hay in 1894 was 254,000 tons; that of 1893, following on the drought of that year, had been 263,000 tons, against only 61,000 tons in 1892. During the early part of 1894 considerable supplies continued to be received—a total of 185,000 tons arriving in the six months ending June 1894.

Four-fifths of the imports, however, of 1893 came in the second half of that year, over 200,000 tons arriving after the 30th of June, whereas in the latter half of 1894 the arrivals of foreign and colonial hay in the United Kingdom were 69,000 tons only, or less than half the quantity of the first six months, and not much over a third of the receipts in the same portion of 1893.

The monthly receipts during 1894 fell off rapidly towards the end of the year, and this will appear from the following contrast of the arrivals of each month in the past three years:—

Month.						1892.	1893.	1894.
						Tons.	Tons.	Tons.
January	-	-	-	-	-	3,135	8,294	31,967
February	-	-	-	-	-	4,283	8,221	26,745
March	-	-	-	-	-	5,439	13,575	41,132
April	-	-	-	-	-	4,346	13,394	35,445
May	-	-	-	-	-	4,404	10,229	32,998
June	-	-	-	-	-	4,439	9,025	16,448
July	-	-	-	-	-	3,634	18,634	14,949
August	-	-	-	-	-	2,472	38,408	18,880
September	-	-	-	-	-	4,748	35,586	9,951
October	-	-	-	-	-	7,412	29,242	8,981
November	-	-	-	-	-	7,676	41,088	9,010
December	-	-	-	-	-	9,249	37,354	7,708
						61,237	263,050	254,214

The countries whence our supplies both of hay and straw came in each of the last two years are shown in the table below.

It will be observed that the figures of the past year, when compared with 1893, exhibit a great fall in the receipts of "Alfalfa" hay from the Argentine Republic, and also a drop of over 50 per cent. in the imports of Canadian and Dutch hay. Increased shipments were, however, recorded in the twelve months ended December last, from the United States, and, on a smaller scale, from France and Algeria.

As regards straw, it will be seen that the increased importation of 20,000 tons was mainly due to much larger shipments from France and Holland than the consignments from the same sources to our ports in the year of drought 1893, when both fodder and litter were so scarce on the Continent of Europe. The straw imports of 1894 were less by 20,000 tons than the quantity received in 1892, in which year France sent across the Channel 42,660 tons, against 2,679 tons in 1893, and 11,605 tons last year.

Countries whence exported.	Hay.		Straw.	
	1893.	1894.	1893.	1894.
	Tons.	Tons.	Tons.	Tons.
Algeria - - - -	731	3,951	414	—
Argentine Republic - -	24,594	805	—	27
Australasia - - - -	49	25	—	—
Belgium - - - -	3,436	3,887	258	1,687
Canada(including Newfoundland)	63,381	28,734	30	30
Canary Islands - - - -	1	—	—	—
Cape of Good Hope - - -	—	1	—	—
Channel Islands - - - -	—	—	—	2
Chile - - - -	3,614	4,070	3	—
Denmark - - - -	4,252	5,042	4,666	2,922
Egypt - - - -	—	—	4	8
France - - - -	1,234	6,206	2,679	11,605
Germany - - - -	2,188	1,929	5,935	6,088
Greece - - - -	—	25	—	—
Holland - - - -	28,332	13,540	11,907	22,612
India, British - - - -	69	—	3	—
Italy - - - -	—	125	—	—
Malta - - - -	9	—	—	—
Norway - - - -	1,674	2,969	2	348
Portugal - - - -	61	—	5	—
Russia, North - - - -	26,839	27,825	5	913
„ South - - - -	855	997	—	511
Spain - - - -	144	364	2	—
Sweden - - - -	235	—	—	14
Tripoli - - - -	—	3	—	—
Tunis - - - -	—	275	—	—
Turkey, European - - -	216	476	—	—
„ Asiatic - - - -	4	542	—	—
United States - - - -	101,132	152,423	424	466
	263,050	254,214	26,337	47,233

IMPORTS OF GRAIN AND FLOUR.

The imports of wheat in grain in the 12 months ended December last were the greatest ever recorded, amounting to 70 million cwts., the largest importation previously recorded was that of 66 million cwts. in 1891.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Wheat - - - -	65,461,988	70,134,355	21,070,028	18,762,569
Wheat meal and flour - -	20,408,168	19,134,605	9,761,510	7,994,673
Barley - - - -	22,844,562	31,244,384	5,776,033	7,090,079
Oats - - - -	13,954,986	14,979,214	4,297,986	3,900,096
Peas - - - -	2,302,443	2,272,623	729,294	647,191
Beans - - - -	3,946,985	5,259,849	1,127,559	1,346,096
Maize - - - -	32,902,503	35,365,043	7,892,629	7,952,237
Other kinds of corn and meal.	—	—	525,332	530,844
Total - - - -	—	—	51,180,371	48,223,785

From the table given below it will be observed that there was a decline of nearly 8,000,000 cwts. in the receipts of wheat arriving in the form of grain from the United States, but this falling off was more than made up by an increase of over 6,000,000 cwts. in the imports from Russia and by an increase of nearly 5,500,000 cwts. in the importation of wheat from the Argentine Republic. As regards flour, there was a slight falling off in the total quantity entered in 1894 as compared with the entries of 1893. The receipts in 1894 from the United States were indeed quite 2,000,000 cwts. less, but arrivals from other countries balanced half of this reduction, so that the aggregate was over 1,000,000 cwts. below that of the previous year. The importation was 3,000,000 cwts. short of the quantity imported in 1892.

Countries.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Wheat :—				
From United States -	32,262,848	24,658,245	10,610,530	6,854,594
„ Russia -	10,061,988	16,775,881	3,095,501	4,284,862
„ Argentine Republic.	7,845,587	13,272,152	2,432,674	3,400,954
„ British East Indies.	6,196,096	5,349,056	1,951,816	1,429,433
Wheat flour :—				
From United States -	17,995,601	15,925,486	8,400,236	6,530,249
„ Austrian Territories.	1,099,614	1,106,971	743,934	667,880
„ British North America.	1,080,986	1,195,421	508,144	481,005
„ other countries	231,967	906,727	109,196	315,539

IMPORTS OF VEGETABLES, HOPS, AND FRUIT.

The imports of vegetables, hops, and fruit in the 12 months ended 31st December 1894 and in the previous year are shown in the following table, from which it will be seen that there was a comparatively large increase in the importation of onions into this country, the entries recorded for 1894 being about 5,288,000 bushels, as against 4,672,000 bushels in 1893, and 4,420,000 bushels in the previous year.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Bushels.	Bushels.	£	£
Vegetables :—				
Onions - - -	4,671,809	5,288,512	783,405	765,049
	Cwts.	Cwts.		
Potatoes - - -	2,828,125	2,703,803	906,952	1,030,091
Unenumerated - - -	—	—	1,076,749	1,090,355
Total - - -	—	—	2,767,106	2,885,495
	Cwts.	Cwts.		
Hops - - -	204,392	189,055	1,141,294	774,378
	Bushels.	Bushels.		
Fruit :—				
Apples - - -	3,459,984	4,967,569	843,532	1,376,411
Oranges - - -	4,593,127	6,593,959	1,368,857	1,828,965
Lemons - - -	1,081,620	1,288,893	334,904	377,255
Cherries - - -	346,148	310,785	194,584	166,163
Plums - - -	777,142	777,411	331,622	302,105
Pears - - -	915,212	1,309,114	347,189	411,325
Grapes - - -	978,505	832,992	530,448	470,428
Unenumerated - - -	1,079,794	1,300,273	447,979	563,794
Total - - -	13,231,532	17,380,996	4,399,115	5,496,446

IMPORTS OF FLAX, HEMP, JUTE, AND SEEDS.

The imports of flax seed in the 12 months of 1894 were nearly 400,000 qrs. in excess of the imports of the previous year. In 1892 the importation of flax seed amounted to 1,900,000 qrs.

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Tons.	Tons.	£	£
Flax - - -	72,268	71,701	2,517,953	2,526,207
Hemp - - -	81,437	83,534	2,115,951	1,897,929
Jute - - -	278,634	338,874	3,672,249	4,615,965
Total - - -	432,339	494,109	8,306,153	9,040,101
	Cwts.	Cwts.		
Seeds :—				
Clover and grass - - -	333,412	340,929	792,061	811,297
	Qrs.	Qrs.		
Flax and linseed - - -	1,700,581	2,088,972	3,475,290	3,941,997
Rape - - -	252,560	299,022	343,424	319,153
Total - - -	—	—	4,610,775	5,072,447

IMPORTS OF HIDES AND TIMBER.

The quantities and values of the imports of hides and timber in the years 1894 and 1893 are shown in the following table. The figures for timber show an increased importation in 1894 of nearly a million loads :—

Description.	Quantities.		Values.	
	1893.	1894.	1893.	1894.
	Cwts.	Cwts.	£	£
Hides, raw, and pieces thereof :—				
Dry - - - - -	357,115	419,225	932,036	987,922
Wet - - - - -	589,198	608,536	1,249,217	1,242,229
Total - - -	946,313	1,027,761	2,181,253	2,230,151
	Loads.	Loads.		
Wood and Timber :—				
Hewn - - - - -	2,126,888	2,338,036	4,048,743	4,187,727
Sawn or split, planed or dressed	4,761,717	5,446,265	10,265,942	11,896,500
Staves of all dimensions - -	131,708	132,157	512,811	540,819
Total - - -	7,020,313	7,916,458	14,827,496	16,625,046

XV.—STATISTICAL TABLES.

I.—PRICES OF MEAT.

AVERAGE PRICES of DEAD MEAT, per Stone of 8 lbs., at the LONDON CENTRAL MEAT MARKET, during the Third and Fourth Quarters of 1894, with the Average Price for the Year.

(Compiled from the prices quoted weekly in the "Meat Trades Journal.")

DESCRIPTION.	3RD QUARTER.				4TH QUARTER.				AVERAGE FOR THE YEAR.			
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
BEEF :—												
Scotch, short sides - - - -	4	4	to 4	7	4	2	to 4	6	4	2	to 4	6
„ „ long sides - - - -	3	10	„	4	1	3	9	„	4	0	3	9
English, Prime - - - -	3	10	„	4	1	3	6	„	3	10	3	8
Cows and Bulls - - - -	2	4	„	2	10	1	11	„	2	5	2	3
American, Birkenhead killed	3	0	„	3	4	2	11	„	3	5	3	1
„ „ Deptford killed -	3	1	„	3	6	2	10	„	3	6	3	1
„ „ Refrig. hind-qrs. -	3	2	„	3	10	2	10	„	3	11	3	1
„ „ „ fore-qrs. -	1	9	„	2	2	1	9	„	2	2	1	10
Danish sides, best - - -									2	6	„	3
„ „ „ seconds - - -									2	0	„	2
MUTTON :—												
Scotch, Prime - - - -	4	8	„	5	1	4	8	„	5	0	4	5
English, Prime - - - -	4	6	„	4	11	4	4	„	4	8	4	3
Ewes - - - -	3	7	„	4	0	3	2	„	3	7	3	5
Merinos - - - -									3	11	„	4
Dutch - - - -												
German - - - -									3	9	„	4
New Zealand - - - -	2	3	„	2	7	2	1	„	2	6	2	6
Australian - - - -	1	11	„	2	2	1	9	„	2	0	2	1
River Plate, Frozen - -	1	9	„	2	0	1	8	„	1	10	1	11
„ „ „ Town killed -	3	8	„	3	11	2	1	„	2	8	3	5
LAMB :—												
English - - - -	4	10	„	5	6	4	6	„	5	1	5	3
New Zealand - - - -	3	2	„	3	6	3	4	„	3	8	3	3
VEAL :—												
English - - - -	3	11	„	4	9	4	2	„	4	10	4	1
Foreign - - - -	3	9	„	4	7	4	1	„	4	9	3	11
PORK :—												
English, small - - - -	4	1	„	4	6	4	0	„	4	4	4	1
„ „ medium and large -												
Foreign - - - -									3	3	„	3

I.—PRICES OF MEAT—*continued.*

AVERAGE WHOLESALE PRICES of CATTLE and SHEEP, per Stone of 8 lbs., sinking the Offal, at the METROPOLITAN CATTLE MARKET, during each Quarter of 1894, with the Mean Prices for the Year.

PERIOD.	CATTLE.			SHEEP.		
	Inferior.	Second.	First.	Inferior.	Second.	First.
1st Quarter -	<i>s. d.</i> 2 4	<i>s. d.</i> 3 11	<i>s. d.</i> 4 6	<i>s. d.</i> 3 6	<i>s. d.</i> 4 10	<i>s. d.</i> 5 7
2nd Quarter -	2 5	3 11	4 6	3 6	4 11	5 8
3rd Quarter -	2 5	4 0	4 7	3 9	5 3	5 11
4th Quarter -	2 6	3 10	4 5	3 8	5 6	6 1
Mean of the } Year.	2 5	3 11	4 6	3 7	5 2	5 10

AVERAGE WHOLESALE PRICES of BEEF and MUTTON, per Stone of 8 lbs., by the Carcase, at LIVERPOOL and GLASGOW, during each Quarter of 1894, with the Mean Prices for the Year.

PERIOD.	LIVERPOOL.*				GLASGOW.†			
	BEEF.		MUTTON.		BEEF.		MUTTON.	
1st Quarter -	<i>s. d.</i> 2 0	<i>s. d.</i> to 3 6	<i>s. d.</i> 3 4	<i>s. d.</i> to 4 10	<i>s. d.</i> 2 6	<i>s. d.</i> to 3 10	<i>s. d.</i> 3 8	<i>s. d.</i> to 4 8
2nd Quarter -	1 10	„ 3 4	3 4	„ 5 0	2 6	„ 4 0	4 0	„ 5 2
3rd Quarter -	2 0	„ 3 6	2 8	„ 4 8	2 4	„ 3 8	3 0	„ 4 8
4th Quarter -	1 10	„ 3 4	2 8	„ 4 8	2 0	„ 3 6	3 4	„ 4 10
Mean of the Year	1 11	„ 3 5	3 0	„ 4 9	2 4	„ 3 9	3 6	„ 4 10

* Compiled from information furnished by the Medical Officer of Health, Liverpool. The prices quoted are for Carcases of Animals slaughtered at the Liverpool Abattoir, and do not apply to Imported Meat.

† Compiled from information furnished by the Principal of the Veterinary College Glasgow.

I.—PRICES OF MEAT—*continued*.

AVERAGE VALUES, per *Cwt.*, of various Kinds of DEAD MEAT Imported into the United Kingdom from FOREIGN COUNTRIES and BRITISH POSSESSIONS in each Quarter of 1894, with the Average Value for the Year.

(Computed from the Trade and Navigation Accounts.)

PERIOD.	BEEF.		MUTTON.		PORK.		BACON.	HAMS.
	Fresh.	Salted.	Fresh.	Fresh.	Salted.			
1st Quarter -	<i>s.</i> 42 <i>d.</i> 5	<i>s.</i> 31 <i>d.</i> 4	<i>s.</i> 39 <i>d.</i> 11	<i>s.</i> 49 <i>d.</i> 1	<i>s.</i> 35 <i>d.</i> 3	<i>s.</i> 45 <i>d.</i> 4	<i>s.</i> 47 <i>d.</i> 4	
2nd Quarter -	40 9	29 4	40 1	47 6	30 6	42 9	47 9	
3rd Quarter -	39 1	26 5	36 9	47 11	26 6	44 8	52 11	
4th Quarter -	38 1	26 0	35 5	48 1	27 4	40 10	47 3	
The Year -	40 1	28 4	37 10	48 5	29 11	43 6	49 1	

II.—CORN PRICES :—WEEKLY AVERAGES.

AVERAGE PRICES of **British Corn**, per Quarter of 8 imperial bushels, computed from the Returns received under the Corn Returns Act, 1882, in each of the under-mentioned Weeks in 1895, and in the Corresponding Weeks in 1894 and 1893.

Weeks ended (in 1895)	Wheat.			Barley.			Oats.		
	1895.	1894.	1893.	1895.	1894.	1893.	1895.	1894.	1893.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Jan. 5 -	20 4	26 4	25 10	21 5	28 10	24 9	14 2	17 8	16 8
" 12 -	20 8	26 4	26 4	21 3	28 10	25 6	13 9	18 0	16 11
" 19 -	20 8	26 3	26 6	21 8	29 2	25 7	14 0	18 0	17 0
" 26 -	20 9	26 1	26 4	21 11	29 1	25 6	13 10	18 0	17 3
Feb. 2 -	20 6	25 7	26 3	21 5	28 11	25 4	13 10	18 1	17 5
" 9 -	19 11	25 3	25 11	21 8	28 8	25 0	13 6	17 10	17 11
" 16 -	19 10	24 10	25 7	21 10	28 3	24 11	13 8	18 0	17 10
" 23 -	19 10	24 5	25 5	22 2	28 0	25 1	13 9	18 4	18 0
Mar. 2 -	19 10	24 3	25 1	21 9	27 5	25 2	14 0	18 5	17 11

II.—CORN PRICES :—QUARTERLY AVERAGES.

AVERAGE PRICES of British Corn per Quarter of 8 imperial bushels,* computed from the Weekly Averages of Corn Returns from the 196 Returning Markets of ENGLAND AND WALES, pursuant to the Corn Returns Act, 1882, together with the QUANTITIES returned as sold at such Markets, in the under-noted periods of the Years 1894, 1893, and 1892.

QUARTER ENDED	PRICES.			QUANTITIES.		
	1894.	1893.	1892.	1894.	1893.	1892.
Wheat.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	25 1	25 7	33 8	613,313	708,986	834,939
Midsummer - -	24 4	26 2	30 11	429,450	674,704	785,022
Michaelmas - -	22 11	26 4	29 3	313,288	577,112	600,916
Christmas - -	19 2	27 2	27 5	600,773	659,258	823,002
Barley.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	28 1	25 2	28 5	671,620	1,092,457	1,191,530
Midsummer - -	25 2	24 0	25 6	40,863	104,155	116,801
Michaelmas - -	22 1	24 1	24 3	95,121	248,829	42,060
Christmas - -	22 7	29 1	26 5	1,921,744	1,920,615	2,143,243
Oats.						
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
Lady Day - -	18 1	17 7	20 3	193,922	201,572	180,600
Midsummer - -	18 7	19 5	21 1	61,862	75,457	55,605
Michaelmas - -	17 11	19 9	20 10	70,824	99,899	34,898
Christmas - -	13 10	18 1	17 6	239,139	198,594	221,063

* Section 8 of the Corn Returns Act, 1882, provides that where returns of purchases of British Corn are made to the local inspector of Corn Returns in any other measure than the imperial bushel or by weight or by a weighed measure, that officer shall convert such returns into the imperial bushel, and in the case of weight or weighed measure the conversion is to be made at the rate of 60 imperial pounds for every bushel of wheat, 50 imperial pounds for every bushel of barley, and 39 imperial pounds for every bushel of oats.

II.—CORN PRICES:—ANNUAL AVERAGES.

AVERAGE PRICES of **British Corn** per Quarter of 8 imperial bushels, computed from the Weekly Averages of Corn Returns from the 196 Returning Markets, together with the QUANTITIES returned as sold at such Markets during each of the Years 1890 to 1894.

YEARS.	PRICES.			QUANTITIES.		
	Wheat.	Barley.	Oats.	Wheat.	Barley.	Oats.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
1890 - - -	31 11	28 8	18 7	3,439,609	3,327,991	599,033
1891 - - -	37 0	28 2	20 0	3,248,743	3,255,518	561,713
1892 - - -	30 3	26 2	19 10	3,052,879	3,493,634	492,166
1893 - - -	26 4	25 7	18 9	2,620,030	3,366,056	575,522
1894 - - -	22 10	24 6	17 1	1,956,824	2,729,348	565,747

II.—CORN PRICES:—HARVEST YEARS.

AVERAGE PRICES of **British Corn** per Quarter of 8 imperial bushels, computed from the Weekly Averages of Corn Returns from the 196 Returning Markets, together with the QUANTITIES returned as sold at such Markets during each of the Harvest Years ending 31st August 1890 to 1894.

HARVEST YEARS.	PRICES.			QUANTITIES.		
	Wheat.	Barley.	Oats.	Wheat.	Barley.	Oats.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>Quarters.</i>	<i>Quarters.</i>	<i>Quarters.</i>
1889-90 - -	31 2	28 10	18 6	3,289,806	3,281,141	558,053
1890-91 - -	35 5	28 0	19 1	3,496,788	3,659,382	602,887
1891-92 - -	33 4	27 2	20 8	3,267,038	3,260,327	488,830
1892-93 - -	26 8	24 10	18 9	2,676,227	3,383,094	547,412
1893-94 - -	25 5	26 5	18 4	2,087,062	2,876,977	542,425

III.—PRICES OF BUTTER, MARGARINE, AND CHEESE.

MEAN WHOLESALE PRICES of BUTTER, MARGARINE, and CHEESE,
in the months of January and February, 1895, and in the
Fourth Quarter of 1894.

(Compiled from the *Grocer*.)

DESCRIPTION.	4th Quarter of 1894.		Month of January 1895.		Month of February 1895.	
	<i>Per Cwt.</i> s. d. s. d.		<i>Per Cwt.</i> s. d. s. d.		<i>Per Cwt.</i> s. d. s. d.	
BUTTER :						
Cloumel - -	—	—	—	—	—	—
Corks, 1sts -	92	1 to —	104	0 to —	—	—
„ 2nds -	77	6 „ —	97	3 „ —	102	9 to —
„ 3rds -	66	3 „ —	76	9 „ —	83	6 „ —
„ 4th -	56	6 „ —	53	9 „ —	54	0 „ —
Friesland - -	91	8 „ 97 0	100	0 „ 104 6	98	0 „ 102 6
Dutch Factories -	96	5 „ 102 9	103	0 „ 108 6	100	6 „ 106 0
French Baskets -	97	10 „ 109 6	113	0 „ 121 6	103	0 „ 116 0
„ Crocks and Firkins.	87	1 „ 94 0	97	6 „ 107 0	89	0 „ 99 0
„ 2nds and 3rds	74	9 „ 82 7	88	0 „ 93 6	79	0 „ 84 6
Jersey - -	—	—	—	—	—	—
States and Canadian	—	—	—	—	—	—
Danish and Swedish	109	6 „ 117 10	109	0 „ 112 6	99	6 „ 108 0
Finnish - -	80	0 „ 96 6	81	6 „ 101 6	82	6 „ 96 6
Russian - -	70	6 „ 91 6	73	0 „ 87 6	69	0 „ 84 0
Colonial - -	64	7 „ 108 7	—	—	—	—
Australian - -	—	—	51	6 „ 103 0	50	0 „ 99 0
New Zealand - -	—	—	51	6 „ 103 0	50	0 „ 99 0
Fresh Rolls (Foreign) per doz.	9	10 „ 13 11	10	7½ „ 15 3	10	0 „ 15 6
MARGARINE :						
Margarine - -	30	0 „ 58 7	30	0 „ 55 6	31	6 „ 54 0
Mixtures - -	56	5 „ 80 1	59	0 „ 79 0	56	0 „ 77 6
CHEESE :						
Cheddar - -	46	0 „ 70 9	46	0 „ 70 6	44	3 „ 73 6
Somerset - -	50	0 „ 68 0	50	0 „ 66 6	49	0 „ 65 6
Cheshire - -	37	10 „ 77 0	36	0 „ 78 0	34	6 „ 79 0
Wiltshire - -	36	2 „ 61 10	31	3 „ 60 0	33	0 „ 61 0
Double Gloucester -	40	3 „ 60 0	36	0 „ 60 0	36	0 „ 60 0
Derby - -	36	5 „ 51 9	32	0 „ 52 0	32	0 „ 51 6

IV.—PRICES of FRUIT and VEGETABLES—*continued.*

MONTHLY MEAN PRICES (WHOLESALE) OF VEGETABLES at the
under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle*.)

DESCRIPTION.	JANUARY.				FEBRUARY.			
	BOROUGH.		STRATFORD.		BOROUGH.		STRATFORD.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Brussels Sprouts, per bushel	—	—	1 4	2 2	—	—	2 0	2 6
per half sieve	0 9	to 1 1	0 9	1 2	1 0	to 1 6	1 0	1 6
Bunch Greens, per tally	—	—	5 0	7 0	—	—	—	—
Cabbages, per tally	2 0	2 9	1 6	2 3	—	—	2 0	2 6
Carrots, per bag	1 6	2 0	—	—	—	—	—	—
per dozen bunches	1 9	2 0	—	—	1 6	2 0	—	—
household, per ton	—	—	23 3½	30 4½	—	—	22 3	26 3
cattle-feeding, per ton	—	—	16 4½	21 10½	—	—	14 6	19 0
Cauliflowers, per dozen	1 7	2 3½	1 2	1 11	2 3	3 0	1 6	3 0
per tally	—	—	6 1½	8 4½	—	—	7 0	12 0
Celery, per bundle	—	—	0 6	1 0	—	—	0 6	1 0
per dozen bundles	8 9½	10 9½	—	—	7 0	13 0	—	—
Greens, per bag	—	—	0 9	1 3	—	—	—	—
per dozen bunches	1 3½	1 10½	5 0	7 5	—	—	3 0	4 0
per tally	—	—	4 0	6 0	—	—	—	—
per dozen	—	—	1 3	1 9	—	—	—	—
Horseradish, per bundle	1 0	1 2	1 0	1 3	1 0	1 2	1 0	1 2
Mangolds, per ton	—	—	13 2	16 7	—	—	10 0	14 0
Onions, English, per ton	53 4	73 4	68 0	86 0	85 0	115 0	85 0	105 0
Dutch,	—	—	49 0	55 0	—	—	—	—
per bag	—	—	2 4	2 9	—	—	2 6	3 4½
Oporto, per case	—	—	5 6	6 6	—	—	—	—
Valencia,	—	—	4 9	7 6	—	—	—	—
foreign, per bag	1 8	2 3	—	—	2 0	2 9	—	—
Parsnips, per bag	2 0	—	2 6	2 9	2 4½	3 6	—	—
per score	0 8	1 6	0 9	0 10	0 8	0 10	0 6	0 9
per ton	—	—	45 0	50 0	—	—	60 0	—
Potatoes,	60 0	110 0	—	—	77 6	115 0	—	—
Imperators, per ton	—	—	77 6	85 0	—	—	—	—
Light-soil Bruces, per ton.	—	—	75 0	85 0	—	—	80 0	90 0
Magnums, Darkland, per ton.	—	—	68 0	73 0	—	—	77 6	82 6
Magnums, Lightland, per ton.	—	—	73 4	85 0	—	—	80 0	100 0
Main Crop Kidneys, per ton.	—	—	80 0	90 0	—	—	80 0	95 0
Scotch Bruces, per ton	—	—	78 4	88 4	—	—	85 0	95 0
Scotch Main Crop, "	—	—	86 8	100 0	—	—	90 0	105 0
Scotch Magnums, "	—	—	77 6	85 0	—	—	80 0	90 0
Sutton's Abundance, per ton.	—	—	80 0	95 0	—	—	80 0	100 0
Rhubarb, per dozen bundles	1 6	—	—	—	1 6	—	1 3	1 6
Savoy, per tally	2 1	2 10	1 8	2 10½	2 9	5 0	2 0	5 0
Swedes, per ton	—	—	10 8	17 4½	—	—	11 0	19 0
Turnips, per bag	1 10	2 9	—	—	1 6	3 0	—	—
per dozen bunches	1 8	2 3	1 10½	2 6½	1 6	2 0	2 7½	3 6
per ton	—	—	37 0	48 0	—	—	37 6	55 0
Turnip-tops, per bushel	—	—	1 0	1 3	—	—	—	—
Watercress, per dozen	—	—	—	—	—	—	0 7	0 8

IV.—PRICES of FRUIT and VEGETABLES—*continued.*

MONTHLY MEAN PRICES (WHOLESALE) of FRUIT at the under-mentioned MARKETS.

(Compiled from the *Gardeners' Chronicle.*)

DESCRIPTION.	December 1894.		January 1895.		February 1895.	
COVENT GARDEN :	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Apples, cooking, per sieve.	3 3	to 4 6	3 0	to 4 0	—	—
Apples, dessert, per half sieve.	2 6	„ 3 1½	2 6	„ 3 0	—	—
Cobs, per 100 lbs. -	25 0	„ 27 6	25 0	„ 27 6	25 0	to 27 6
Grapes, 1st quality, Black English, per lb.	1 0	„ 2 0	1 0	„ 2 0	1 4	„ 2 4
Grapes, 2nd quality, English, per lb.	0 6	„ 1 0	0 6	„ 1 0	0 6	„ 1 0
Pears, dessert, per half sieve.	3 0	„ 6 0	—	—	—	—
Tomatoes, per lb. -	0 3	„ 0 6	0 3	„ 0 6	0 3	„ 0 6
FARRINGTON :						
Apples, American Greenings, per barrel.	—	—	17 6	„ 19 0	15 0	„ 20 0
Apples, Canadian, per barrel.	14 0	„ 16 6	13 0	„ 16 6	12 6	„ 17 0
Apples, cooking, per bushel.	3 6	„ 6 0	—	—	—	—
Apples, per bushel - Chestnuts, per bag of 110 lbs.	—	—	3 0	„ 4 6	—	—
	14 0	„ 15 0	12 0	„ 14 4	—	—
Grapes, English, per lb.	0 9	„ 1 3	1 2	„ 1 6	1 3	„ 2 6
Pears, Californian, per case.	8 0	„ 10 0	7 8	„ 13 4	—	—
Pears, per case -	4 0	„ —	—	—	—	—
Tomatoes, trays -	—	—	0 10	„ —	—	—
STRATFORD :						
Apples, American, per barrel.	13 0	„ 17 0	13 6	„ 17 0	12 6	„ 16 6
Apples, English, per bushel.	2 6	„ 5 6	2 4¾	„ 5 8	3 3	„ 6 0
BOROUGH AND SPITAL-FIELDS :						
Apples, Canadian, per barrel.	10 0	„ 18 0	12 0	„ 18 0	13 0	„ 18 0
Apples, English, per bushel.	3 0	„ 9 0	3 0	„ 9 0	3 0	„ 9 0
Apples, other sorts, per barrel.	8 0	„ 10 0	8 0	„ 13 2	8 0	„ 10 0
Pears, per bushel -	2 0	„ 4 6	1 6	„ 3 0	—	—

V.—DISEASES OF ANIMALS IN GREAT BRITAIN.

NUMBER OF CATTLE returned as **SLAUGHTERED**, by order of the Board of Agriculture, on account of **Pleuro-Pneumonia** and Number of **SWINE** returned as having **DIED** from **Swine-Fever**, or as having been **SLAUGHTERED**, by order of the Board of Agriculture, in Great Britain in each of the under-mentioned periods.

QUARTER ENDED	Pleuro-Pneumonia.			Swine-Fever.		
	CATTLE Slaughtered as Diseased, including those which were found after Slaughter to be diseased.	CATTLE Slaughtered as having been in Contact with Cattle affected or as having been otherwise exposed to infection.	CATTLE Slaughtered as Suspected, but found free from Pleuro-Pneumonia.	SWINE that Died of Swine-Fever.	SWINE Slaughtered as Diseased, or as having been exposed to infection.	SWINE Slaughtered as Suspected, but found free from Swine-Fever.
	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>
December 1894	—	—	5	1,212	7,622	290
September 1894	7	88	7	1,971	12,311	435
June 1894 -	8	303	16	2,186	22,306	374
March 1894 -	—	—	13	1,862	14,057	221
December 1893	5	422	19	*1,652	*7,536	*93
September 1893	12	389	26	1,384	2,033	—
June 1893 -	13	346	22	1,872	3,395	—
March 1893 -	—	—	19	1,259	2,438	—

* The powers vested in the Board of Agriculture under the Contagious Diseases (Animals) Act 1893, with respect to Swine-Fever, took effect on the 1st November 1893.

NUMBER OF PLACES upon which **OUTBREAKS** were reported as having taken place, and Number of **ANIMALS** returned as having been **ATTACKED** by **ANTHRAX**, **GLANDERS**, and **RABIES** in Great Britain in each of the under-mentioned periods.

QUARTER ENDED	Anthrax.		Glanders (including Farcy).		Rabies.
	OUT-BREAKS.	ANIMALS ATTACKED.	OUT-BREAKS.	ANIMALS ATTACKED.	DISEASED ANIMALS KILLED or DIED.
	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>
December 1894	106	162	212	332	111
September 1894	91	220	230	372	49
June 1894 -	113	254	230	351	60
March 1894 -	184	364	293	382	38
December 1893	179	414	312	441	45
September 1893	153	332	352	536	6
June 1893 -	113	267	336	498	23
March 1893 -	118	287	381	658	20

VI.—DISEASES OF ANIMALS IN IRELAND.

NUMBER of CATTLE returned as SLAUGHTERED, by order of the Lord Lieutenant and Privy Council in Ireland, on account of **Pleuro-Pneumonia**, and Number of SWINE returned as having Died from **Swine-Fever**, or as having been SLAUGHTERED, by order of the Lord Lieutenant and Privy Council in Ireland, in each of the under-mentioned periods.

QUARTER ENDED	Pleuro-Pneumonia.			Swine Fever.		
	CATTLE Slaughtered as Diseased, including those which were found after Slaughter to be diseased.	CATTLE Slaughtered as having been in Contact with Cattle affected or as having been otherwise exposed to infection.	CATTLE Slaughtered as Suspected, but found free from Pleuro-Pneumonia.	SWINE that Died of Swine-Fever.	SWINE Slaughtered as Diseased, or as having been exposed to infection.	SWINE Slaughtered as Suspected, but found free from Swine-Fever.
	No.	No.	No.	No.	No.	No.
December 1894	—	—	—	562	6,146	947
September 1894	—	—	1	902	9,446	651
June 1894 -	—	—	5	932	12,060	71
March 1894 -	—	—	22	540	7,749	159
December 1893	—	—	25	} *409	*1,259	*34
September 1893	—	35	48			
June 1893 -	—	—	35			
March 1893 -	—	—	59			

* The powers vested in the Lord Lieutenant and Privy Council in Ireland under the Contagious Diseases (Animals) Act, 1893, with respect to Swine-Fever, took effect on the 1st November 1893.

NUMBER of Places upon which OUTBREAKS were reported as having taken place, and Number of ANIMALS returned as having been ATTACKED by ANTHRAX, GLANDERS, and RABIES in each of the under-mentioned periods.

QUARTER ENDED	Anthrax.		Glanders (including Farcy).		Rabies.
	OUT-BREAKS.	ANIMALS ATTACKED.	OUT-BREAKS.	ANIMALS ATTACKED.	DISEASED ANIMALS KILLED OR DIED.
	No.	No.	No.	No.	No.
December 1894	1	2	2	3	244
September 1894	1	1	6	19	242
June 1894 -	—	—	4	9	213
March 1894 -	3	3	1	1	89
December 1893	2	3	2	6	91
September 1893	10	31	—	—	137
June 1893 -	5	6	2	3	122
March 1893 -	5	5	2	2	75

XVI.—THE UNITED STATES TARIFF.

The Board of Trade have published a return respecting the Customs Tariff of the United States, from which the following comparative statement has been prepared showing the rates of import duty leviable on agricultural and allied products under the Tariff Act passed by Congress on the 14th August 1894, compared with those previously leviable under the Tariff Act of 1890 :—

Tariff Classification.	Rates of Duty.	
	Under New Tariff.	Under Old Tariff.
	£ s. d.	£ s. d.
AGRICULTURAL PRODUCTS AND PROVISIONS.		
Animals, live, not specially provided for:—		
Cattle, more than one year old -	20 % ad val.	Each 2 1 8
„ one year old or less -		„ 0 8 4
Hogs -		„ 0 6 3
Horses and mules valued at less than 150 dols -		„ 6 5 0
Horses and mules valued at 150 dols. and over -		30 % ad val.
Sheep, one year old or more -		Each 0 6 3
„ less than one year old -		„ 0 3 1 $\frac{1}{2}$
All other live animals not specially provided for -		20 % ad val.
Breadstuffs and farinaceous substances:—		
Buckwheat - - -	20 % ad val.	Bush. of 48 lbs. } 0 0 7 $\frac{1}{2}$
Corn-meal - - -		„ } 0 0 10
Oats - - -		Bush. } 0 0 7 $\frac{3}{4}$
Rye - - -		„ } 0 0 5
Rye-flour - - -		Cwt. } 0 2 4
Wheat - - -		Bush. } 0 1 0 $\frac{3}{4}$
Wheat-flour - - -		25 % ad val.
Oatmeal - - -	15 % „	Cwt. } 0 4 8
Barley - - -	30 % „	Bush. of 48 lbs. } 0 1 3
Barley, pearled, patent, or hulled		Cwt. } 0 9 4
Barley malt - - -	40 % „	Bush. of 34 lbs. } 0 1 10 $\frac{1}{2}$
Dairy products:—		
Butter and substitutes therefor -	Cwt. 0 18 8	Cwt. 1 8 0
Cheese - - -	„ 0 18 8	„ 1 8 0
Milk, preserved or condensed, including weight of packages.	„ 0 9 4	„ 0 14 0
Sugar of milk - - -	„ 1 3 4	„ 1 17 4

Tariff Classification.	Rates of Duty.	
	Under New Tariff.	Under Old Tariff.
	£ s. d.	£ s. d.
Farm and field products :—		
Beans - - - - -	20 % ad val. {	Bush. of 60 lbs. } 0 1 8
Beans, peas, and mushrooms, prepared or preserved in tins, jars, bottles, or otherwise -	30 % " {	40 % ad val. {
Other vegetables prepared or preserved - - - - -		
Pickles and sauces of all kinds -		
Eggs - - - - -	Doz. 0 0 1½	Doz. 0 0 2½
Hay - - - - -	Ton 0 8 4	Ton 0 16 8
Honey - - - - -	Gall. 0 0 6	Gall. 0 1 0
Hops - - - - -	Cwt. 1 17 4	Cwt. 3 10 0
Onions - - - - -	Bush. 0 0 10¼	Bush. 0 1 8½
Pease, dried - - - - -	" 0 0 10¼	" 0 0 10¼
" split - - - - -	Bush. of 60 lbs. } 0 2 1	Bush. of 60 lbs. } 0 2 1
" in cartons, papers, or other small packages.	Cwt. 0 4 8	Cwt. 0 4 8
Potatoes - - - - -	Bush. of 60 lbs. } 0 0 7½	Bush. of 60 lbs. } 0 1 0½
Fruits and nuts:—		
Fruits:—		
Apples, green or ripe - - -	20 % ad val. {	Bush. 0 1 0¾
" dried, desiccated, evaporated, or prepared in any manner, and not otherwise provided for - - - - -		Cwt. 0 9 4
Grapes - - - - -	20 % ad val. {	Barrel of 3 cub. ft. capacity or part thereof } 0 2 6
Comfits, sweetmeats, and fruits preserved in sugar, syrup, or molasses, not specially provided for, and jellies of all kinds.	30 % "	35 % ad val.
Fruits preserved in their own juices.	20 % "	30 % "
Nuts:		
Almonds, not shelled - - -	Cwt. 0 14 0	Cwt. 1 3 4
" clear shelled - - - - -	" 1 3 4	" 1 15 0
Filberts and walnuts of all kinds, not shelled.	" 0 9 4	" 0 14 0
Filberts and walnuts of all kinds, shelled.	" 0 18 8	" 1 8 0
Meat products:—		
Fresh beef, mutton, and pork -	20 % ad val.	" 0 9 4
Extract of meat, all not specially provided for.	15 % "	" 8 3 4
Fluid extract of meat - - -	—	" 3 10 0
Lard - - - - -	Cwt. 0 4 8	" 0 9 4
Meats of all kinds, prepared or preserved, not specially provided for.	20 % ad val.	*25 % ad val.
*Bacon and hams - - - - -	—	Cwt. 1 3 4
Poultry - - - - -	Cwt. 0 9 4	" 0 14 0
" dressed - - - - -	" 0 14 0	" 1 3 4

Tariff Classification.	Rates of Duty.	
	Under New Tariff.	Under Old Tariff.
Osiers or willow, prepared for basket-makers' use.	20 % ad val.	30 % ad val.
Seeds:— Garden seeds, agricultural seeds, and other seeds, not specially provided for.	10 % „	20 % „
Straw - - - - -	15 % „	30 % „
Teazles - - - - -	15 % „	30 % „
Vegetables in their natural state, not specially provided for.	10 % „	25 % „
Miscellaneous products:— Mustard, ground, preserved, or prepared, in bottles or otherwise.	25 % „	£ s. d. Cwt. 2 6 8
Orchids, lily of the valley, azaleas, palms, and other plants used for forcing under glass for cut flowers or decorative purposes.	10 % „	Free.

FREE LIST UNDER THE NEW TARIFF.

Acorns, raw, dried or undried, but unground.

Animals imported specially for breeding purposes. Provided that no such animal shall be admitted free unless pure bred of a recognised breed, and duly registered in the book of record established for that breed; and the Secretary of the Treasury may prescribe such additional regulations as may be required for the strict enforcement of this provision.

Cattle, horses, sheep, or other domestic animals which have strayed across the boundary line into any foreign country, or have been or may be driven across such boundary line by the owner for pasturage purposes, together with their increase, may be brought back to the United States free of duty under regulations to be prescribed by the Secretary of the Treasury.

Animals brought into the United States temporarily for a period not exceeding six months, for the purpose of exhibition or competition for prizes offered by any agricultural or racing association; but a bond shall be given in accordance with regulations prescribed by the Secretary of the Treasury.

Teams of animals, including their harness and tackle and the waggons and other vehicles actually owned by persons emigrating from foreign countries to the United States with their families, and in actual use for the purpose of such emigration, under such regulations as the Secretary of the Treasury may prescribe.

Birds, and land and water fowls.

Broom corn.

Cabbages.

Cider.

Eggs of birds, fish, and insects.

Note.—This is not to be held to include the eggs of game birds, the importation of which is prohibited, except specimens for scientific collections.

Feathers and downs for beds.

Feathers and downs of all kinds, crude or not dressed, coloured or manufactured, not specially provided for.

Fruits, green, ripe, or dried, not specially provided for.

Grasses and fibres:—

Jute.

Flax straw.

Flax, not hackled.

Flax, jute, and tow wastes.

All other textile grasses or fibrous vegetable substances, unmanufactured or undressed, not specially provided for.

FREE LIST UNDER THE NEW TARIFF—*continued.*

Hair of horse, cattle, and other animals, cleaned or uncleaned, drawn or undrawn, not specially provided for.

Hides and skins, raw or uncured, whether dry, salted, or pickled.

Hide cuttings, raw, with or without hair, and all other glue stock.

Hoofs unmanufactured.

Hop roots for cultivation.

Horns and parts of, unmanufactured, including horn strips and tips.

Milk, fresh.

Ploughs, tooth and disc harrows, harvesters, reapers, agricultural drills, and planters, mowers, horse-rakes, cultivators, threshing machines, and cotton gins.

Provided, that all articles mentioned in this paragraph, if imported from a country which lays an import duty on like articles imported from the United States, shall be subject to the duties in force under the tariff of 1890.

Pease, green, in bulk or in barrels, sacks, or similar packages.

Plants, trees, shrubs, and vines of all kinds commonly known as nursery stock, not specially provided for.

Rennets, raw or prepared.

Seeds, anise, canary, caraway, cardamom, coriander, cotton, croton, cummin, fennel, fenugreek, hemp, horehound, mustard, rape, Saint John's bread or bean, sugar-beet, mangel-wurzel, sorghum or sugar cane for seed, and all flower and grass seeds, bulbs and roots, not edible, all the foregoing not specially provided for.

Wood:—

Hubs for wheels, posts, last blocks, waggon-blocks, oar blocks, gun blocks, heading and all like blocks or sticks, rough hewn or sawed only.

Wool.

POST OFFICE SAVINGS BANKS, WITH GOVERNMENT SECURITY.

ADVANTAGES TO DEPOSITORS.

SECURITY. The Post Office Savings Banks are established by Act of Parliament, and every depositor has the *direct security* of the State for the repayment of his deposits.

DEPOSITS. Any sum from a shilling upwards, excluding pence, may be deposited at one time, and any number of deposits may be made in the course of a year (ending 31st December) up to a limit of 50*l.* A person may have 200*l.* in all on his Deposit Account, including interest.

WITHDRAWALS can be made with the utmost promptitude by sending notice by post to the London Chief Office on the form provided for the purpose, which is obtainable at any Post Office Savings Bank, and payment can be received at any Post Office Savings Bank in the United Kingdom convenient to the Depositor without regard to the Office of deposit. During any year ending 31st December, a depositor may replace the amount of any one withdrawal previously made in the same year.

INTEREST at the rate of 2*l.* 10*s.* per cent. per annum is allowed on every complete pound deposited so long as the sum to a depositor's credit does not exceed 200*l.* Whenever the balance exceeds that sum interest will be allowed on 200*l.*, and the excess will be invested for the Depositor in Government Stock unless the Depositor should otherwise direct.

TRANSFER FROM A TRUSTEE SAVINGS BANK. If a Depositor in a Trustee Savings Bank wishes to place his money in a Post Office Savings Bank, he should apply to the Trustees of the Savings Bank for a Certificate of Transfer (in the form prescribed by the 10th Section of the Act 24 Vict. c. 14), and should pay the certificate into any Post Office Savings Bank as if it were a cheque. By adopting this course, the Depositor will avoid trouble and the risk of carrying cash from one bank to the other.

DEPOSITOR'S BOOK CAN BE USED AT ANY POST OFFICE SAVINGS BANK. A Depositor may add to his deposits, or withdraw the whole or any part of them, at any Post Office Savings Bank in the United Kingdom, without change of deposit book.

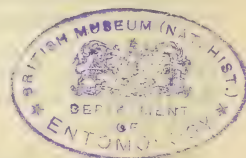
NOMINATIONS. A Depositor of the age of 16 years, or upwards, may, subject to certain limits, nominate any person to receive his Savings Bank deposits at death. A form for the purpose may be obtained, free of cost, from the Controller of the Savings Bank Department.

SECRECY. The strictest secrecy is observed with respect to the names and addresses of Depositors in Post Office Savings Banks, and the amounts deposited or withdrawn by them.

POSTAGE FREE. No charge for postage is made to a Depositor, if in the United Kingdom, for any letter passing between him and the Chief Office on Post Office Savings Bank business.

LIST OF LEAFLETS ISSUED BY THE BOARD OF AGRICULTURE.

Number.	Title.
A 3.—1893 I.	Cultivation of Osiers.
A 4.— „ I.	Insects on Fruit Trees.
A 5.— „ I.	The Mangel Wurzel Fly.
A 7.— „ I.	Autumn Catch Crops and Fodder Supply.
A 8.— „ I.	Farmers and Assessments to Local Rates.
A 9.— „ I.	Ensilage.
A 10.— „ I.	The Ribbon Footed Corn-Fly.
A 11.— „ I.	Anthrax.
A 12.— „ I.	The Gooseberry Saw-Fly.
A 13.— „ I.	Acorn Poisoning.
A 14.— „ I.	The Raspberry Moth.
A 15.— „ I.	The Apple Blossom Weevil.
A 16.— „ I.	The Apple Sucker.
A 17.— „ I.	Preservation of Commons.
A 18.— „ I.	Fertilisers and Feeding Stuffs Act, 1893.
A 1.—1894 I.	Mites on Currant and Nut Trees.
A 2.— „ I.	Vine and Raspberry Weevils.
A 3.— „ I.	The Diamond Back Moth.
A 4.— „ I.	The Daddy Longlegs.
A 5.— „ I.	Potato Disease.
A 6.— „ I.	The Warble Fly.
A 7.— „ I.	Farmers and the Income Tax.
A 8.— „ I.	Moths on Fruit Trees.
A 9.— „ I.	Remission of Tithe Rentcharge.
A 10.— „ I.	Wireworms.



Copies of the above leaflets are to be obtained free of charge and post free on application to the Secretary, Board of Agriculture, 4, Whitehall Place, London, S.W. Letters of application so addressed need not be stamped.



4 APR 09

Special
attention
given to
Colonial
and
Export
Orders.



Applications
invited
for
Home
and
Colonial
Agencies.

GUANO. Raw, Equalised, Dissolved.
SUPERPHOSPHATES.
26% to 40% SOLUBLE.

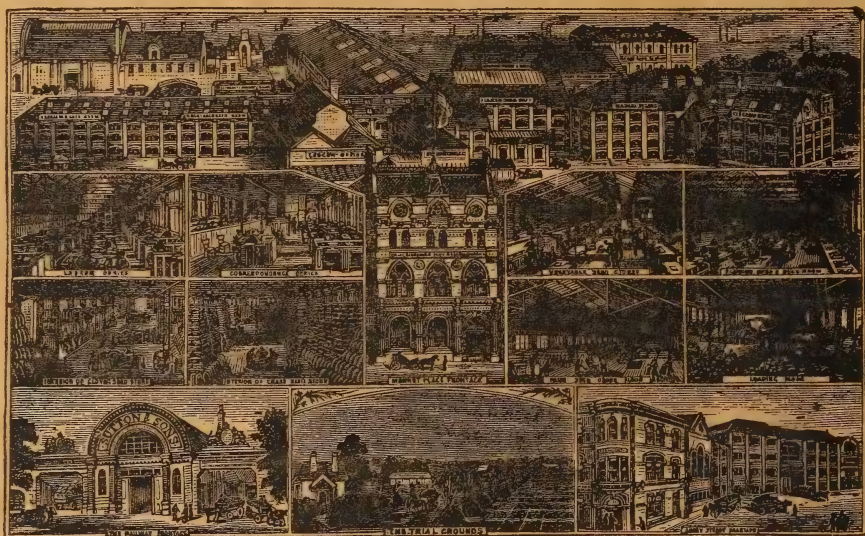
BONE MANURES.
CEREAL, SUGAR, COFFEE
AND OTHER
SPECIAL MANURES.

DANIEL DE PASS & CO.,
1, FENCHURCH BUILDINGS, LONDON.

SUTTON'S SEEDS

FOR THE FARM & GARDEN.

GRASS, CLOVER, MANGEL, SWEDE & TURNIP.



A MINIATURE VIEW OF THE ROYAL SEED ESTABLISHMENT, READING.

To obtain Particulars of all the Best Seeds for the Garden, send for
SUTTON'S GARDEN SEED CATALOGUE FOR 1895,
 containing descriptions and illustrations of all the leading varieties both for
 Home and Market use.

PERMANENT AND TEMPORARY PASTURES,
 By MARTIN J. SUTTON.

THE BEST WORK ON GRASS LANDS.

Illustrated with 23 superior Wood Engravings of Grasses, Clovers, &c. The Book also contains 46 Analyses of Grasses, Clovers, &c., prepared expressly for this work by Dr. J. Augustus Voelcker. Fifth Edition, 5s., post free.

POPULAR EDITION, including all the chapters contained in the Fifth Edition, but omitting the Illustrations, Analyses, and Index. Paper cover, 1s., post free.

**SUTTON'S FARMERS' YEAR BOOK AND
 GRAZIERS' MANUAL FOR 1895,**

Should be carefully read by all interested in the present crisis of Agriculture. It contains Illustrations and Descriptions of all the best Natural Grasses and Clovers, and particulars of the most suitable Mixtures for Permanent and Temporary Pastures; also an extract from Mr. Martin John Sutton's paper, entitled: "The Conversion of English Arable Land to Grass," read by him before The Farmers' Club on February 4th, 1895.

No Agents.

No Agents.

SUTTON'S SEEDS

GENUINE ONLY FROM SUTTON & SONS, READING.

